SusChem 2017 Brokerage Event

UK Companies interested in H2020 Call Topics
Following the referendum last year, the UK government issued a statement giving more clarity and security with regard to involvement of UK organisations in EU projects until the actual leave date.

**Assurances include financial underwriting:**

“where UK organisations bid directly to the European Commission on a competitive basis for EU funding projects while we are still a member of the EU, for example universities participating in Horizon 2020, the Treasury will underwrite the payments of such awards, even when specific projects continue beyond the UK’s departure from the EU” ([https://www.gov.uk/government/news/chancellor-philip-hammond-guarantees-eu-funding-beyond-date-uk-leaves-the-eu](https://www.gov.uk/government/news/chancellor-philip-hammond-guarantees-eu-funding-beyond-date-uk-leaves-the-eu))
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SUSCHEM UK - OVERVIEW

- Alliance of 5 partner organisations
- Knowledge Transfer Network (KTN) secretariat

- Support industry in setting agenda for sustainable chemistry and proving chemistry-based solutions
KNOWLEDGE TRANSFER NETWORK AS PARTNER IN EU PROJECTS

Who we are:

- Not-for-profit SME, Innovate UK’s (UK funding agency for business innovation) networking partner
- We help businesses get the best out of creativity, ideas and the latest discoveries, to strengthen the UK economy and improve people’s lives.
- From agri-food to autonomous systems and from energy to design, KTN combines in-depth knowledge in all sectors with the ability to cross boundaries – 109 sector experts

What we do:

- We connect people and provide access to funding & finance support (over 2,800 B2B introductions, over 300 events, over 51,000 newsletter subscribers)
- We support national strategy development & manage stakeholder councils
- We engage at ETP level, e.g. SusChem, EuMat, etc.
The KTN aims to participate in European projects that increase business collaboration, facilitate exploitation, and increase business led R&D.

**Anticipated roles within projects are:**

- clustering of partners and advance networking, particularly across sectors and value chains;
- mapping of capabilities;
- identification of mechanisms to exploit developed IP;
- and developing the capabilities of businesses to innovate.
The KTN works as the Network Partner for Innovate UK, which funds business R&D on behalf of BEIS (UK Government Department for Business, Energy and Industrial Strategy). The KTN therefore has a remit to cover all areas of funded R&D.

Current **high priority areas** include:

- Healthcare & medicines
- Robotics and AI
- Clean & flexible energy
- Driverless vehicles
- Manufacturing and materials of the future
- Satellites and space technology
Special Interest Groups (SIGs) are funded by Innovate UK and set up by the KTN and supported by UK business to build communities and develop strategy for key themes.

Current SIGs

- Additive Manufacturing
- Energy Harvesting
- Immersive Experience
- Robotics and AI
- Synthetic Biology
- Compound Semiconductors
- Graphene & 2D Materials
- Quantum Technologies
- Sustainable Aviation
- Uncertainty Quantification and Management in High Value Manufacturing
The Synthetic Biology Special Interest Group (SynBio SIG) helps to partner the UK’s growing synthetic biology industry with industrial collaborators, research-base expertise, investment opportunities and funders.

Funded by Innovate UK and BBSRC, the SynBio SIG is coordinated by the Knowledge Transfer Network to bring together the UK’s best and brightest biotechnologists and help them form new, productive partnerships and collaborations.

We are working hard with the UK Synthetic Biology Leadership Council (SBLC) in the implementation of *Biodesign for the Bioeconomy*, the UK Synthetic Biology Strategic Plan 2016, to establish an internationally competitive synthetic biology industry in the UK.

**Possible Contributions to call topics**

- Previous work with British Standards Institute, the SBLC and UK stakeholders around SynBio standards
- Variety of stakeholders (academic & industrial), including connections to relevant BBSRC Networks in Industrial Biotechnology & Bioenergy (BBSRC NIBBs)
Jaguar Land Rover (JLR): Britain's premium car company that creates experiences you will love for life.

JLR is seeking collaborative partners to investigate opportunities to reduce the environmental impact and financial costs of creating its vehicles.

JLR is keen to explore opportunities that reduce the impact of the creation of virgin materials or that harness the potential of circular economy.

Opportunities must create a solution that is either a “drop in” alternative to existing parts or that offer alternative attributes suitable for a premium automotive application. The environmental improvements must be demonstrable through Life Cycle Assessments and the application must be scalable to automotive requirements.
POTENTIAL END USER: JAGUAR LAND ROVER

JLR is seeking these opportunities across all the materials used in vehicles. e.g.

- Aluminium
- Steel
- Polymers
- Magnesium
- Glass
- Electronics
- Copper
- Lacquers / Adhesives / Paints
- Natural Materials (e.g. leather, wood)
- HV Battery Materials
- EV Motor Material
- Composite Materials
POTENTIAL END USER: UNILEVER

Concurrent Product-Process Design: Sustainable Growth

- Challenges of formulated products
• **What are we looking for**
  
  • Multiscale modelling linking molecular scale with computational fluid dynamics
  
  • Intensified processes for structure formation and separations
  
  • Transforming processes e.g. Additive Manufacturing
  
  • Processing & material solutions which significantly reduce material, energy & water usage
Who we are

• UK-based SME specialising in liquid-particle separation systems
• Combined knowledge of engineering and biology

What is unique about us:

• Microfluidics based solutions to performed combined job of filters, membranes and centrifuges
• Sustainable systems designed with circular economy in mind
• Modular design makes the technology easily scalable
• Applications in bio-production market for cell separation, microbe based biomass concentration, microbe/particles harvesting
Opportunity

Downstream processing is known to be the most energy intensive process in Biomanufacture, accounting for up to 80% or production cost due to inefficient and complicated multistep processes.
EXPERTED IMPACTS

Bioseparation Instruments €6bn Market

Customer Value Proposition

€700,000 less in 1st year

- Downstream Savings
- Operational Cost
- Installed Capital Cost

Climate Impact

1.37 Mt CO2e reduction

- Indirect Impact through enabling production of biomass in bioreactors
- 20x more productive than farmland
- Does not compete for fertile land
- Does not need freshwater

Conventional Tech
uFraction8 Tech

Global Emissions (tCO2e)

Conventional
uFraction8

0
500,000
1,000,000
1,500,000
2,000,000
2,500,000
3,000,000
3,500,000
4,000,000

0
200,000
400,000
600,000
800,000
1,000,000
1,200,000
1,400,000
1,600,000
1,800,000

uFraction8 have ongoing projects and collaborations including

UFraction8 are looking to join a consortium and are able to contribute:

- Sustainable, energy efficient, and scalable downstream processing technology
- Liquid-particle separation, cell separation, microbe based biomass concentration, microbe/particles harvesting
TECHNOLOGY PROVIDER: SPIRE CONTROL LTD

Who we are:

- UK based SME specialising in advanced analytics and closed-loop control solutions for the continuous process industries.
- Extremely knowledgeable in the underlying mathematical principles of industrial control, as well as having a strong-track record in leading large scale Advanced Process Control projects, particularly in ethylene production and gas processing.
- Our technology includes analytic tools that make use of machine learning, and predictive closed-loop control technology that facilitates optimisation of processes.

What is unique about us:

- Where other solutions are remote from the main control network, our technology is integrated into existing control hardware. This facilitates ‘plug & play’ deployments that scale effectively, are more reliable, and easily serviceable. Other advantages include that an integrated approach vastly increases system security and makes more data interface options available such as Fieldbus, Modbus, and OPC UA.
Opportunity:

- In energy intensive industries, savings can be made by utilising more efficient energy streams, heat recovery, and raw materials flows with variable properties. The difficulty is the variability of the energy source and achieving integration among different production sectors.

What Spiro Control can contribute:

- Novel solution for implementing an integrated control scheme that will enable cooperation between different unit processes to solve a plant-wide objective function.
TECHNOLOGY PROVIDER: SPIRE CONTROL LTD

DT-SPIRE-06-2019: Digital technologies for improved performance in cognitive production plants

Opportunity:
- Increased capability to perform “control at the edge”; microprocessor-based devices at the edge are smart enough to invoke actions—to solve logic or do closed-loop control—without having to “phone home” to a central host or human operator.

What Spiro Control can contribute:
- Platform for deploying APC and advanced analytics applications on an edge device able to collect, filter, and relay data close to industrial processes.
- Toolset, process insight, and capability to develop machine learning and AI models of industrial processes. As mentioned above we also have an edge device designed for deployment of those AI models.
SOFTWARE SOLUTIONS: GRANTA DESIGN

Who we are... ([www.grantadesign.com](http://www.grantadesign.com))
- SME, est. 1994, 160 employees dedicated to materials information management technology to advance materials engineering and education to enable better, greener, safer products
- World’s largest team solely focused on materials information technology with a global presence (EU, USA, ASIA)

What we do...
- Develop software for materials information management and materials selection—structured, interoperable, experimental and virtual information management for full traceability
- Develop databases of materials information for selection (technical, cost, environmental performance)
SOFTWARE SOLUTIONS: GRANTA DESIGN

Opportunities...

- Intelligent decision making regarding material choice for sustainable construction and retrofitting. Develop database containing information on data collected from existing buildings - enable decisions incorporating environmental performance to be made.

- Sustainable database for Cluster activities:
  - Experimental and virtual data management
  - Interoperable with modelling platforms, CAD, CAE, PLM, etc.
  - Tools for materials selection (environmental, circular economy, socio-economic, cost, performance property data)

- Experienced EU collaborator (www.grantadesign.com/company/collaborations/)

Topics requiring material database development, e.g.
LC-EEB-06-2018-20: ICT enabled, sustainable and affordable residential building construction, design to end of life (IA 50%)
LC-EEB-01-2019: Integration of energy smart materials in non-residential buildings (IA 50%)
TECHNOLOGY PROVIDER: THE SHADOW ROBOT COMPANY

Who we are:

• UK & Spain based SME, developing dexterous robotics manipulation technologies ('hands for robots') and using them to solve real world problems.
• Longest running robotics company in UK, with over 20 years experience in domestic and European projects.

What we do:

• Solve manipulation problems for clients around the world
• Experts in grasping and manipulation for robots
• Currently partnering in European projects COROMA (industrial manufacturing) and RAMCIP (assisted living), as well as 7 Innovate UK projects
Opportunity:

- The **Smart Grasping System** is more than an industrial gripper – it's a “grasper”, with built-in intelligence.

- Key features will include:
  - **A library of different grasps** - you can use one Hand to pick up many types of objects, reducing the number of Hands in your factory.
  - **Torque sensing on each joint**, a revolutionary addition ensuring the hand can make the most accurate and reliable grasp.
  - **Easy to programme and use**, saving you time and money on training.
  - **An in-built vision system** so that the Hand can ‘see’ what it’s about to grasp and select the correct grasp for each object.

**DT-NMBP-09-2018**: Accelerating the uptake of materials modelling software (IA)
**DT-FOF-02-2018**: Effective Industrial Human-Robot Collaboration (RIA)
Who we are:

- Bitrez is a resin-manufacturing organisation that offers an extensive range of highly innovative materials developed for applications within the Coatings, Composites, Insulation and Adhesive sectors.
- UK SME, privately owned, 100 employees.
- R&D development and sampling of customised high performance Synthetic Resins and formulated Matrix Systems, designed for process and application.
- Thermoset, Thermoplastic & Bio based chemistries
- 1500T per annum manufacturing capability

What we do:

- Development and scale-up of unique, multifunctional, fast cure resin systems (free from SVHC’s) for Composites, Coatings, Insulation and Adhesion of various applications within high performance sectors such as Aerospace, Rail, Automotive and Energy.
Opportunity

- Significant reduction in cycle time and cost whilst improving process
- Enhancement of physical, mechanical and functional properties through synthesis / additive technology (inc. high temperature, high Tg, FST, chemical / UV / Ozone resistance)
- Further development of Bio based / recyclable materials
- Removal of all banned substances (REACH)

What we are looking for:

- **Collaborative projects** – working as part of a consortium to co-develop new, innovative material technologies – graphene enhanced resins, biobased and recyclable materials
- **Responsive supply chain** – material evaluation, carrier optimisation, sampling, testing
- **OEM engagement** – direct development of Graphene/2D enhanced resin systems for Composites, Coatings and Insulation applications
Who we are:

- **Laser Additive Solutions Ltd** – we are a 2-year old micro-SME specializing in LASER ADDITIVE MANUFACTURING. The company owner has since 2004 developed laser repair and manufacturing processes for multiple aero and power generation companies.

What we do:

- We use LASER METAL DEPOSITION and laser-based NON-CONTACT MEASURING technology to develop and implement laser based repair and hybrid-manufacturing processes for blue-chip engineering companies such as Rolls-Royce and Siemens.
What we have to offer:

• We have installed the latest 3D LASER METAL DEPOSITION equipment that allows us to repair, make or modify parts up to 3 x 2m in size. We are very technology focused and pride ourselves on the high integrity AM/laser welding processes we have developed during the last decade.

• The company is very flexible and we are looking for new development opportunities to help us grow into a much larger AM organisation.

• We are looking for forward-thinking companies that have an interest in AM for high-value engineering components. This could be for hybrid-manufacturing or repair type purposes.

• We can supply AM know-how and capability – and so we are interested in collaborating with End-users, material suppliers, universities and other technology providers.
The directors at LiMETOOLS have spent over eleven years working with experts in the psychology of learning in the workplace; and digital storytellers and game-makers who can make complex ideas or processes accessible and empower people to change their habits.

The tools combine elements of interactive scenario decision-making into learning pathways that are carefully designed to work with the learner in a holistic way. We don’t just interrogate process; we explore each individual’s world of work and play. Our learning management software enables large organisations to canvas opinion within the teaching tools and then measure individual, departmental and company-wide capacity building.

Our modular products are designed to suit existing organisational workflow, cascaded down throughout the workforce and supply chains, maximising the interactive capability of mobile, tablet and desk-top platforms. Internal Campaign tools, language versioning and multi-device platforms are all built in if needed.
COMMUNICATION & SKILLS: LIME TOOLS

1. Uses social cognitive theory within learning packages to quickly immerse users in the workplace

2. Moves away from ‘push’ teaching to a more interactive storytelling and gaming environment, using broadcast documentary, fictional scenarios and quiz formats to ensure knowledge transfer is retained

3. Facilitates Personal Action plans that change habits within each organisational member’s daily work

4. Captures the data to aggregate measurements of capacity growth, energy use and new habit retention, offering departmental, site location and peer-to-peer comparisons to inform strategy

**Our Process**

1. **Buildings @ Work** – a tool for global facility managers that not only widen their horizons and skill sets about energy security, but also supports the development of their own Personal Action Plan – Winner RBS Innovation Gateway BEST CONCEPT AWARD

2. **High Stakes** – a fictionalised game of roulette played between academics, policy-makers and business executives who were trying to understand the implications of the Asian Development Bank’s report on the economic impact of climate change – HMG FCO


4. **Your Call!** – a workshop scenario game to be played over 5 days that uses video drama interventions to stimulate workshop decision-making analysis on a typical large-scale project with critical E&S factors – World Bank ESF

**Our Products**
Currently kicking off an H2020 project to design & build an energy efficiency interactive suite of behaviour change modules in a project titled FEEdBACk, for users in R&D, Office Buildings and Housing Estates.

We seek to collaborate with others who are looking at scalable energy reduction interventions that, whilst they may be complex to deliver, can measurably challenge organisational behavioural change inertia in large organisations.

LiMETOOLS and its sister company EUCONNECT have delivered, between 2003-2017, 10 projects from FP6 and FP7 to H2020 on innovation, entrepreneurship, communication & dissemination and energy efficiency.

For more background information visit www.limetools.biz
SUMMARY
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## ADDITIONAL INTERESTS – UK OPEN FOR BUSINESS

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**SUSCHEM** – Presentation title
Upcoming: H2020 Consortia Building Workshop
Circular Economy and Raw Materials – Challenge 5: 22\textsuperscript{nd} November 2017, London


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