

Headlines

Overview of the granted projects of the 4th transnational joint call

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Final conference of the 2nd ERA-IB joint call

On Wednesday 26 February 2014, the final seminar of the second transnational joint call was organized by the ERA-IB-2 consortium. During this event all the outcomes of the ten pan-European projects of this call were presented.

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Second platform meeting of IB-related ERA-Nets

The SMWK was pleased to welcome 27 participants to the second platform meeting of IB-related ERA-Nets under ERA-IB-2 in Dresden on 5th and 6th May 2014. All project representatives shared information about the goals, activities and experiences of their ERA-Nets related to Industrial Biotechnology and other innovative technologies.

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“Horizon 2020” – The EU Framework Programme for Research and Innovation

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Industrial Biotech: The Way Ahead - Breaking Through the Current Barriers Facing the Industry

BIO-TIC, funded by the European Commission, aims to establish an overview of the barriers to innovation in Industrial Biotechnology in Europe and to

formulate action plans to overcome them. It focused on five product groups where there is perceived to be a significant potential for the EU to develop a competitive advantage. These are advanced biofuels (ethanol and aviation biofuels), biosurfactants, chemical building blocks, bioplastics and CO₂ as a feedstock for chemicals. Marking the halfway point of the BIO-TIC project, three draft roadmaps focusing on the market, technological and non-technological aspects of Industrial Biotechnology in Europe were launched for public consultation at the end of April.

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Bio innovation growth mega-cluster

On 19th of May the trilateral cooperation between Flanders, the Netherlands and North Rhine –Westphalia was launched under the name of Bio Innovation Growth Mega-Cluster: BIG-C.

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Knowledge for Growth

On 8 May 2014 the 10th edition of Knowledge for Growth was organized in Ghent. Knowledge for Growth is Europe’s leading regional biotech and annual life sciences convention.

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The UK launched a new activity: the Industrial Biotechnology Catalyst

In January 2014, the UK launched a new activity: the Industrial Biotechnology Catalyst. Catalysts are run jointly by the Technology Strategy Board and the Research Councils. A Catalyst is a form of research and development funding which focuses on a specific priority area and aims to help take projects from research to as close to commercial viability as possible.

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Overview of the granted projects of the 4th transnational joint call

The granted projects of the 4th transnational joint call are known: Nine projects out of 45 submissions will receive funding for approximately 14 Mio euros in total. Seven out of nine projects are already up and running. The projects Terpenosome (Engineered compartments for monoterpene production using synthetic) and CHImmerASE (Integrated Platform for de novo Design and Development of a Chimeric Enzyme for high-value chemicals) will start in July this year.

This transnational joint call is the first call in collaboration with EuroTransBio (ETB), which is a self-sustained network of ten research programme funding and/or management organizations with a focus on industrial research especially SME's. ETB has established itself as the preferred funding instrument for small and medium sized enterprises (SMEs) collaborating in the field of modern biotechnology.

A complete overview and a summary of each project can be found on the ERA-IB website under joint calls.

The selected projects cover one or more of the following topics:
Improved enzyme systems for new and more efficient bioprocesses;
Metabolic engineering of microorganisms, including the use of synthetic and systems biology

ANTHOPLUS – ANTHOCyanin production Platform Using Suspension cultures, cooperation between Germany, UK and Norway.

TERPENOSOME – Engineered compartments for monoterpene production using synthetic biology, cooperation between UK, Germany and Norway.

NBCPBH – Production of new bioactive compounds by plants and bacteria using new and improved halogenases, cooperation between Germany, UK and Portugal.

INNOVATE – Investigating NOvel VALuable bio-Therapeutics and Expression systems, cooperation between UK, Germany and Portugal.

ProSeCa – Recovery of high value Proteins from Serum by innovative direct Capture techniques, cooperation between Germany, UK and Denmark.

CHImmerASE - Integrated Platform for de novo Design and Development of a Chimeric Enzyme for high-value chemicals, cooperation between Portugal, Germany and Austria.

ELMO – Novel carbohydrate-modifying enzymes for fibre modification, cooperation between Finland, Germany and Poland.

DeYeast Library – Designer yeast strain library optimized for metabolic engineering applications, cooperation between Germany, Portugal and Denmark.

IPCRES – Integrated Process and Cell Refactoring Systems for enhanced industrial biotechnology, cooperation between UK, Germany, Portugal, Denmark, Spain and Austria.

approaches; Novel down-stream processes e.g. reduced costs; Fermentation and bio-catalytic processes, e.g. for platform chemicals, including bio-monomers, oligomers and polymers; Biological processing (including separation and conversion) of biomass, including from side

streams, and other renewable carbon sources into value added products; New valuable products from plant- and animal cell cultures.

With this joint call, ERA-IB and ETB want to foster the integration of subsequent steps along the whole value chain.

Final conference of the 2nd ERA-IB joint call

On Wednesday 26 February 2014, the final seminar of the second transnational joint call was organized by the ERA-IB-2 consortium. During this event all the outcomes of the ten pan-European projects of this call were presented.

All ten projects, out of 46 submissions, were funded for a total granted budget of 11.1 Million euro and ran for app. 3 years.

This call was open for researchers in Flanders (Belgium), Finland, France, Germany, Saxony (Germany), Poland, Portugal, Spain, Romania and The Netherlands. Organizations participating in the second ERA-IB joint call for proposals are: IWT (Flanders-Belgium), MSES (Croatia), Tekes (Finland), ADEME (France),

BMBF (Germany), SMUL (Germany - Freestate of Saxony), NCBiR (Poland), FCT (Portugal), MICINN (Spain), UEFISC (Romania), NWO, ACTS and NGI (The Netherlands).

The different projects involved several of the following topics: Novel enzymes and microorganisms for new and more efficient; bioprocesses; metabolic engineering for the improvement of industrial; microorganisms, including synthetic biology approaches; enzyme design combining rational and or evolutionary methods; development of multi-enzyme processes and modular enzymes; microbial stress under process conditions; development of new platform chemicals, including biomonomers; development of new

and functionalized biopolymers; process analytical technologies for improved bioprocess understanding; scale-up of bioprocesses; innovative down-stream processing and biocatalyst recycling; and biotechnological upgrading and valorization of biorefinery byproducts.

ERA-IB-2's YouTube channel

An overview of the given presentations from the seminar can be found on ERA-IB-2's YouTube channel: <https://www.youtube.com/user/ERANetIB>. The PowerPoint presentations are available on the ERA-IB website. A complete and coherent overview with the results of the granted projects of the 2nd joint call will be available by the end of summer in our next call brochure!

Second platform meeting of IB-related ERA-Nets



The SMWK was pleased to welcome 27 participants to the second platform meeting of IB-related ERA-Nets under ERA-IB-2 in Dresden on 5th and 6th May 2014. All project representatives shared information about the goals, activities and experiences of their ERA-Nets related to Industrial Biotechnology and other innovative technologies.

Affiliated initiatives, such as JPI FACCE, ETP SusChem/IB, PPP Spire and the PLATFORM project (platform of KBBE-relevant ERA-Nets) also presented the latest developments and challenges in their field of work.

After an informative overview of the Commission's latest research and innovation programme, "HORIZON 2020", by Jens Hoegel from DG Research, representatives of ETP SusChem and PPP Spire demonstrated in their

presentations how to organise a stronger collaboration of research and industry and how to approach research and innovation closer to the market.

The delegates of all ERA-Nets used the possibility to present the characteristics, outreach and activities typical of their network. The longstanding networks ERA-Chemistry, EuroTransBio and ERA-NET Bioenergy explained how they coped with the transition from an EC-funded to a self-sustained network, what the main challenges were and how they now organise their activities. A final round table discussion offered the possibility to exchange ideas and experiences about the challenges of the transformation into sustainable networks, which synergies would help to surmount them and which ERA-Nets might pool their activities.

In summary, all participants agreed that the challenges all ERA-Nets face towards the end of



the EC-funded phase can only be overcome by bringing all possible partners and means of research, industry and politics together and by finding solutions how to keep partners on board. Some attendees suggested that a better coordination and an assessment of the efficiency of the networking activities could also improve sustainability. Another option could be a trust fund for ERA-Net coordinators set up at EU level, in order to facilitate core activities which are organised by a small number of partners. Also the strengthening and support of small or East European countries

could prevent these countries from having to decline participation in self-sustained networks and enable them to take on core tasks within a network. The platform meeting ended with a large accumulation of ideas, experiences and a great will to move forward.

A 3rd and final platform meeting of IB-related ERA-Nets is foreseen for 2015 and will probably be organised in summer of that year.

*Sandra Hauße, SMWK
Karen Görner, FNR*

“Horizon 2020” – The EU Framework Programme for Research and Innovation

On 1 January 2014, EU’s largest research and innovation programme ‘Horizon 2020’ was set in motion.

Horizon 2020 is the financial instrument which will implement the Innovation Union, one of the seven Flagship initiatives of the EU 2020 strategy. This initiative aims to secure Europe’s global competitiveness and strive for smart, sustainable and inclusive economic growth and the creation of jobs. With Horizon 2020, nearly 80 billion euro of funding will be available for the upcoming seven years (2014-2020).

Policy goals and biotechnological research under Horizon 2020

Horizon 2020 strives to implement the following EU policy goals:

- Enhance competitiveness of EU industries and create additional highly-skilled jobs:
- building competitive bio-based industries and value chains in the EU
- Moving to a low carbon economy
- Reducing GHG emissions
- ‘Cascading principle’ and ‘Closing the loops’
- Re-instate economic growth in rural areas
- Sustainable valorisation of all resources (edible/non-edible) from agriculture and forestry
- Increase independence from fossil resources
- Utilising alternative resources
- Raising the contribution of industry to EU GDP to 20% by 2020

Key enabling technologies – KETs

One of the cornerstones of the EU’s innovation policy and Horizon 2020 are the Key Enabling Technologies (KETs). Industrial biotechnology is one of the identified technologies. The other KETs are nanotechnology micro- and nanoelectronics including semiconductors, advanced materials, photonics and advanced manufacturing systems.

The Horizon 2020 programme is subdivided in three pillars:

- Excellent Science: aims to reinforce and extend the excellence of the Union’s science base and to consolidate the European Research Area in order to make the Union’s research and innovation system more competitive on a global scale.

- Industrial Leadership: aims to speed up development of the technologies and innovations that will underpin tomorrow’s businesses and help innovative European SMEs to grow into world-leading companies.
- Societal Challenges: A challenge-based approach will bring together resources and knowledge across different fields, technologies and disciplines, including social sciences and the humanities. This will cover activities from research to market with a new focus on innovation-related activities, such as piloting, demonstration, test-beds, and support for public procurement and market uptake. It will include establishing links with the activities of the European Innovation Partnerships (EIP).

The previous Framework Programme FP7 has spent approximately 650 million euro for the Knowledge-Based Bio-Economy. Horizon 2020 foresees more than 1500 million euro for Leadership in enabling and industrial technologies (LEIT) – Biotechnology (2nd pillar Industrial Leadership) and Societal Challenge 2. To learn more on biotechnological research under Horizon 2020 download the presentation on our website www.era-ib.net/Horizon2020EUFramework.

Calls under Horizon 2020

The first calls for proposal under the work programme 2014-2015 were published in December 2013. A complete overview and how to participate can be found on the European Commission’s participants portal: <http://ec.europa.eu/research/participants/portal>.

Industrial Biotech: The Way Ahead - Breaking Through the Current Barriers Facing the Industry

BIO-TIC, funded by the European Commission, aims to establish an overview of the barriers to innovation in Industrial Biotechnology in Europe and to formulate action plans to overcome them. It focused on five product groups where there is perceived to be a significant potential for the EU to develop a competitive advantage. These are advanced biofuels (ethanol and aviation biofuels), biosurfactants, chemical building blocks, bioplastics and CO₂ as a feedstock for chemicals.

Marking the halfway point of the BIO-TIC project, three draft roadmaps focusing on the market, technological and non-technological aspects of Industrial Biotechnology in Europe were launched for public consultation at the end of April. These draft roadmaps integrate the results obtained from an in-depth literature review, the results of over 60 one-on-one interviews with experts and eight regional workshops held in various EU Member States in 2013 and early 2014.

IB Market Potential in the EU to 2030

The draft market roadmap shows how in 2013, the EU market for IB amounted to an estimated 29 billion EUR. As shown in Figure 1, the BIO-TIC project estimates that the IB market will grow significantly to 2030, reaching 45 billion EUR in 2020 and 52 billion EUR in 2030. Antibiotics and biogas are expected to remain large but proportionally stagnant product segments, whereas bioethanol and bioplastics are expected to develop rapidly. Aviation biofuels are expected to become a distinct market sector by 2030.

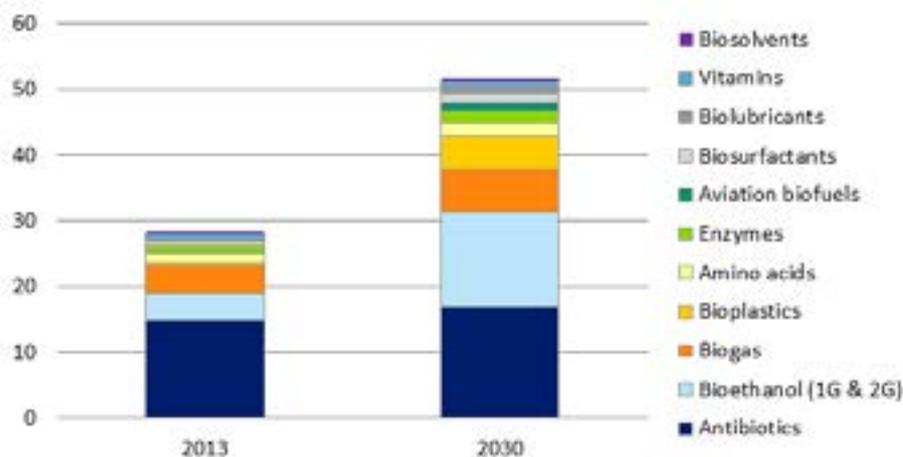


Figure 1 EU IB Market Development to 2030

Identifying the Best Route Forward for Industrial Biotechnology in Europe

The BIO-TIC roadmaps investigate the hurdles and enablers for five IB product groups: chemical building blocks, bioplastics, biosurfactants, CO₂ as a feedstock for IB processes and advanced biofuels (ethanol and aviation biofuels). The BIO-TIC project is based on extensive stakeholder consultation to gather results that accurately reflect the reality faced by each product group, therefore the BIO-TIC partners would like to discuss the findings of the draft roadmaps during product group specific workshops taking place from September to December 2014.

The biosurfactants market is faced with substantial costs because of the strict EU regulatory framework. However, the potential use of waste materials and the large range of possible end users are considerable enablers for the biosurfactant market in the EU. The EU market could reach between 0.9 and 1.8 BEUR by 2030.

General Hurdles to Industrial Biotechnology in Europe

Across the five business cases considered, a set of overarching hurdles appear to dominate the IB landscape in Europe.

The main technological hurdles are:

- Poor process performance in terms of bioconversion;
- Interactions within enzyme systems hamper scale-up;
- High downstream processing costs due to the impurities produced by biocatalytic systems;
- Uncertainties surrounding feedstock availability;
- Concerns that the feedstock currently used for IB processes is in competition with food uses.

On the policy and regulatory side, the main barriers for IB can be grouped into four categories:

- Investment and finance: the capital requirements for scale-up and production facilities are high. This is a particular issue for IB which is perceived to be a sector with high investment risk;
- Public perception and communication: the public perception and awareness of IB and biobased products is poor;
- Demand side policy: there is a lack of incentives or efficient policies in the field for many IB products (with the notable exception of ethanol);
- Feedstock: it is difficult to obtain feedstock at affordable prices and to secure large quantities of biomass all year around

Subsequently, in order to realise its market potential, the European IB sector essentially needs to focus on improving its cost competitiveness, image, and the functionality of its products. Cost competitiveness, as discussed later, is the greatest challenge that the EU faces in terms of overall IB market development given that it is influenced by multiple factors.

The Impact of Hurdles and Enablers on Different Product Groups

Whilst there are a common series of barriers across the IB industry, the weight of these factors varies between product groups. During the eight regional workshops held in 2013/2014, the BIO-TIC partners gathered stakeholder thoughts on the development of the IB industry and biofuels, bioplastics and chemical building blocks within their region. *(No information was gathered for either biosurfactants or CO₂ as a feedstock for chemical production in these workshops due to the sample size for these product groups being too small to allow meaningful conclusions to be drawn.)* As shown in Figure 2, in terms of hurdles, the biofuels product segment appears to be most impacted by policies and regulations, whereas it is market entry issues that hamper the development of bioplastics, and R&D for chemical building blocks.

Participate in the biosurfactants workshop on 3rd September 2014 in Berlin to comment on the biosurfactants findings!

CO₂ holds great potential as a feedstock for chemicals production using IB processes, especially in the EU where there is an abundance of CO₂ available and because CO₂ is not part of the food chain. However, logistical and cost challenges in terms of CO₂ transport and distribution could hamper the potential of CO₂ to be used for chemicals. What developments are required to realise the full market potential of CO₂? Join the discussion during the CO₂ workshop for IB on 24th September 2014 in Lyon!

The estimated EU market for chemical building blocks in 2030 could be between 4.8 and 10.4 BEUR according to the BIO-TIC project. Should the EU focus on a broad chemical building block portfolio or should it reap the benefits from its strong R&D base and the current developments in favour of shale gas to develop a competitive advantage in biomass derived aromatics and C₃/C₄ chemicals? To discuss these and other matters, join the chemical building blocks workshop on 1st October 2014 in Reims!

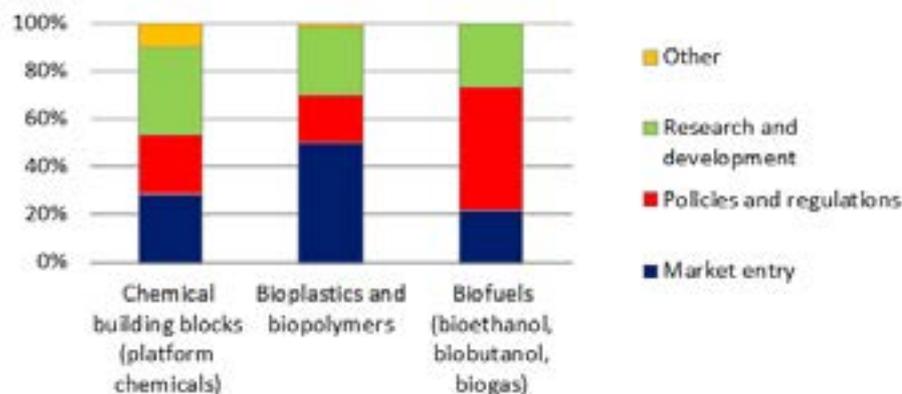


Figure 2 The Importance of IB Hurdles by Product Group

Similarly, the importance of different drivers varies by product sector. The biofuels business case for example appears to be more policy-driven, whilst bioplastics appears to be most driven by brand issues and chemical building blocks by feedstock cost competitiveness. Overall, stakeholders believe that there are currently more barriers than enablers for the uptake of IB and biobased products in Europe.

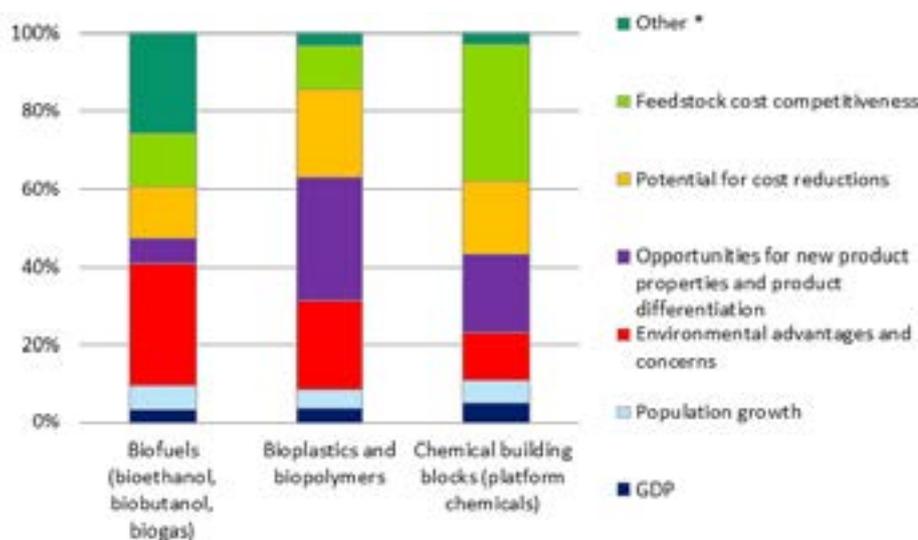


Figure 3 The Importance of IB Enablers by Product Group
Other refers to policy and regulation issues.

In general, stakeholders from industry, research, administration and policy shared similar views on the barriers to IB with more confidence in the potential for chemical building blocks and bioplastics than biofuels. Regionally, stakeholders' views of future market developments was largely optimistic in Italy, Nordic countries and France, whereas in Germany, UK and Ireland, Benelux, Poland and Spain, there was a more negative view of market developments.

Bioplastics companies have clear environmental benefits and could have increasing competitiveness due to rising oil prices. The bioplastics market in 2030 could reach to 6.7 BEUR. Give your opinion on this and many more aspects of bioplastics development during the dedicated bioplastics workshop in Brussels on 1st December 2014.

It is estimated that EU ethanol demand could amount to 14.4 BEUR by 2030 while the EU aviation biofuels market could reach up to 6.8 BEUR by 2030. Will the increasing oil price and the processing flexibility of biofuels overrun the poor public acceptance and feedstock issues related to biofuels? Join the dedicated business case workshop for advanced biofuels to discuss, comment and assess these findings and many more (date and location to be confirmed).

To express an interest in attending any of these workshops please contact Claire Gray, BIO-TIC project coordinator at bio-tic@europabio.org or follow the links from the BIO-TIC website.

Overcoming the challenges of IB in Europe

BIO-TIC has shown that product cost-competitiveness is the greatest challenge for the EU IB industry, as it is impacted by numerous market, technological and non-technological factors. The BIO-TIC project suggests that product cost-competitiveness could be improved in the EU through:

- The creation of fair competition for biomass with other sectors that currently benefit from subsidising schemes, for example the bioenergy and biofuels sectors.
- Measures to bring down biomass transport costs, such as localised processing of biomass in decentralised processing hubs.
- Efficient recycling systems to enable new types of feedstock to be used. Waste feedstocks could help overcome concerns over using food materials for IB products, but clear legislation and definitions of what a waste product is, is needed to achieve this.
- Improved process efficiency. In particular issues surrounding low yield and productivity of biocatalytic systems could be achieved through developing biocatalysts and microorganisms with increased performance whilst cost issues for cleaning up the impurities produced from biocatalytic systems could be addressed through technology transfer from the chemical industry.
- The development of technologies for economically feasible small volume production
- Development of new and added value products to global markets, and
- Support for commercialisation and investments and for the creation of early-stage demand.

In terms of image, the IB sector would benefit from an improved public perception, thus reducing the brand

risk of IB. This would require new solutions to demonstrate the environmental benefits, communicate with consumers, and ultimately, to enable a bio-premium to help overcome cost-competitiveness concerns in the EU compared to elsewhere in the world.

Perspective - Towards 2030

It is clear that Europe has a significant potential to develop a competitive IB sector by 2030. Five product groups in particular have significant potential – these are biofuels, bioplastics, biosurfactants, chemical building blocks and CO₂ for chemicals using IB. However, in order to achieve this potential, many hurdles need to be overcome. While there are many common hurdles, the impact each of these have on different product groups varies significantly. The EU needs to consider where it can best position itself in an increasingly competitive global market.

The BIO-TIC roadmaps have been released now in draft form in order to test the recommendations suggested and to collect innovative new ideas to enable Europe to capture the full potential IB. Please visit the BIO-TIC website to access the full version of the roadmaps and don't hesitate to send your comments and suggestions to bio-tic@europabio.org by the end of August 2014. The output from this consultation, together with the results of the product group specific workshops (see sidebar "Identifying the Best Route Forward for Industrial Biotechnology in Europe"), will be merged into a final integrated IB roadmap for Europe in summer 2015 and used to influence EU policy in this increasingly important area.

Claire Gray, BIO-TIC project coordinator at bio-tic@europabio.org

Bio innovation growth mega-cluster

On 19th of May the trilateral cooperation between Flanders, the Netherlands and North Rhine – Westphalia was launched under the name of Bio Innovation Growth Mega-Cluster: BIG-C. This is an initiative by BE-Basic, CLIB2021 and FISCH and is supported by: Biobased Delta, Biobased Economy Limburg, BioBase Europe, BIO. NRW, BioSC, CEF.NRW, CINBIOS, CleanTechNRW, Cluster Agrifood and Biobased Noord-Nederland, Dutch Regional Development Agencies, Flanders Bio, Ghent Bio-Economy Valley.

This mega cluster is a cross-border smart specialization initiative aiming at transforming the regions' chemical cluster, also known as Antwerpen-Rotterdam-Rhine-Ruhr (ARRR), into the global leader of bio-based innovation growth.

Due to its excellent position in the 4 Pillars of Competitiveness being institutions, infrastructure, macroeconomics and education the ARRR cluster has for decades been a powerhouse of industrial innovation in the chemistry sector. BIG-C proposes to join forces in moving towards renewable resources.

By leveraging the ARRR in facing the upcoming transition towards the bio-economy, prosperity is

secured and the most relevant societal challenges of industrial employment, raw material scarcity and climate change are addressed.

Powerful strategy

BIG-C proposes a powerful strategy by integrating new and established value chains from the very beginning. This can be achieved by:

- working with bio- and fossil-based feedstock in order to reach feedstock-flexibility;
- using sustainable and recycled feedstock available in the regions;
- integrating bio-based intermediates into synthetic chemistry;
- intensifying the processes.

Governance

BIG-C proposes to build on and bridge between existing and proven national pre-competitive public-private partnerships (PPP's such as the research programs under CLIB2021, BE-Basic, FISCH and others), pilot and training facilities, demonstration plants and other assets from the ARRR-region on the one hand, and the Joint Technology Initiative in the field of Bio-based Industries (JTI-BBI) and PPP Sustainable Process Industry through Resource and Energy Efficiency (PPP-SPIRE) on the other.

This way the Mega-Cluster will leverage the national programs regarding for instance the Smart Specialisation Strategies as well as the European Horizon2020 strategy through workable and ready-to-implement sustainable flagship value chains. BIG-C will create the foundations to use so far neglected resources to produce chemicals up to consumer products and energy carriers in a cascading valorization process.

Through implementing bio innovations it will fundamentally shift the base of our daily life from fossil to biobased and other renewable resources. At the same time BIG-C will strengthen the economy building on and further developing the 4 Pillars of Competitiveness by Smart Specialization and will cooperate with initiatives like SPIRE and BBI and with the regional governments and organisations. The exact way in which to do this will be discussed with SPIRE, BIC and the regions.

Knowledge for Growth

On 8 May 2014 the 10th edition of Knowledge for Growth was organized in Ghent. Knowledge for Growth is Europe's leading regional biotech and annual life sciences convention. This year's edition welcomed more than 1.100 participants and 130 companies. The theme was Biotech for society 2024: what will be the key societal challenges in 2024 and how will the life sciences sector help to address those. One of the main ingredients of Knowledge for Growth is its elaborate program of more than 30 thought-provoking talks, giving the audience a perspective on the latest evolutions and future perspectives of the global / European / Flemish life sciences landscape (covering healthcare, agricultural and industrial biotech). During this event attendees could follow plenary sessions, such as 'Knowledge for good growth in agriculture', given by Syngenta. There was also the opportunity to learn more about the attending organizations and their projects via the research posters' exhibition. Interesting posters concerning industrial biotechnology were: Efficient synthesis of specialty carbohydrates through industrial biotechnology, presented by Inbiose; Methanotrophs on building materials: a sustainable biocatalyst for a concomitant building material surface protection and atmospheric methane removal, presented by UGent – Lab of Microbial Ecology and Technology; Optimization and control of a two-stage fermentation for heterotrophic PHB production, presented by UGent. This conference was organized by FlandersBio one of the few clusters in Europe representing all the different elements of the life sciences. The next edition will take place on 21 May 2015.

The UK launched a new activity: the Industrial Biotechnology Catalyst

In January 2014, the UK launched a new activity: the Industrial Biotechnology Catalyst. Catalysts are run jointly by the Technology Strategy Board and the Research Councils. A Catalyst is a form of research and development funding which focuses on a specific priority area and aims to help take projects from research to as close to commercial viability as possible.

The Catalyst model supports projects in priority areas where the UK research base has a leading position and where there is clear commercial potential. Three levels of funding are usually available, varying according to how close a project is to commercialisation, with applicants able to join at any phase. Catalyst funding is offered through an ongoing competition. Individual businesses (and academics where supported), and consortia of businesses and academics, have the opportunity to propose projects which will create new knowledge and future products, processes and services.

The Industrial Biotechnology Catalyst will accelerate the commercialisation of industrial biotechnology-derived products and processes. It has been set up by the Technology Strategy Board, the Biotechnology and Biological Sciences Research Council (BBSRC) and the Engineering and Physical Sciences Research Council

(EPSRC). Initial funding of £45m is available in 2014-15.

The Industrial Biotechnology Catalyst supports businesses and researchers in developing innovative solutions to challenges in industrial biotechnology and bioenergy.

It will fund projects that develop biological processes, or a combination of biological and chemical approaches, in:

- production of fine and speciality chemicals and natural products (for example fragrances, flavours, pharmaceutical intermediates);
- production of commodity, platform and intermediate chemicals and materials (for example plastics, resins and textiles);
- production of liquid and gaseous biofuels;
- production of peptides and proteins (for example enzymes, antibiotics, recombinant biologics);
- novel or improved upstream or downstream processes to reduce costs or improve efficiency.

Any UK-registered business or academic undertaking research and development may apply for funding. Norwegian partners can participate in projects but should confirm their eligibility with Innovation Norway first.

Merlin Goldman