

Annex to the note rtd.ddg3.e.2(2012)1572144

This note refers to the CAB/DG meeting of 26 September 2012 and the request of Commissioner Geoghegan-Quinn to address a number of specific aspects, in particular:

- the rationale
- the objectives
- how to increase EU-12 involvement
- how to ensure simplification
- the concrete proposals for private sector involvement.

The rationale of the Bio-based Industries JTI

The JTI under consideration builds on existing segments of bio-based industries, **aiming to align and structure their current activities along value chains**. Primary producers and industrial sectors involved include, agro-businesses, the chemical industry (biochemicals and bioplastics), biotechnology companies (enzymes and biochemistry), biofuels, pulp and paper and sugar and starch industries, and some large international consumer goods companies.

Cost-competitive newly developed bio-based products (e.g. biochemicals, bioplastics and biofuels) are only available now for some EU niche markets and in niche applications. They have however high economic prospects to be realised both by already established sectors traditionally using biomass (e.g. biotech, pulp and paper, starch, sugar, etc.), which need to diversify their products, by sectors which are increasing the biomass share in their raw materials portfolio (e.g. chemical industry) and by a newly developed bio-industry (e.g. biochemicals, bioplastics). The sustainable large-scale supply of sufficient quantities of EU biomass and the development and upscaling of alternative industrial process technologies, using biochemistry and biology in appropriate combinations with other technologies remain major challenges. However, if successful, the initiative will provide farmers and foresters with additional income opportunities, will contribute to additional jobs particularly in rural areas and increase competitiveness of EU industries on the basis of technological leadership.

In line with considerations in the Bio-economy Strategy and in the proposed Horizon 2020, a JTI "Bio-based Industries" is proposed for the following main reasons:

- Most private operators in the area of bio-based industries are relatively small, while bio-based activities concern often only a relatively small part of the activities of larger operators (e.g. chemical companies). Therefore, no single private party in the area of bio-based industries is likely to individually deploy the resources required to cover the necessary R&D activities. Forming the partnerships typically involves high transaction costs and complexities. Public intervention is required to stimulate private partners along whole value chains and at a pan-European level enhancing R&D cooperation and investment.
- There is a high level of risk involved in so far as multiple technological options exist for the same process or product, with no guarantee as to which option will be a winner. Furthermore, companies also have limited or no control on the policy environment which has

a decisive impact on market development. Given the large number of EU policies affecting value chains of bio-based industries (e.g. CAP, RED and ILUC, Climate, Lead Market Initiative), the JTI would provide the necessary communication platform to explain and promote the activities considered.

- Successful deployment of new processes at large scale will often involve many companies in different geographical areas. While IP protection does provide a way to "appropriate" the benefits of corporate R&D, there are many aspects of the innovations required (e.g. innovation in the supply chain) for which companies will have difficulty to internalize the benefits. Public support in the form of a JTI is therefore considered appropriate to help overcome this market failure for bio-based industries.

The objectives of the potential JTI

The strategic JTI objectives **currently discussed** with industries are as follows (baseline 2012 data):

- Guarantee a secure and sustainable supply of non-food biomass for the supply of European biorefineries through the development of integrated and sustainable agricultural and forestry value chains for both food and non-food applications;
- 10% increase of biomass supply in Europe by 2020 (at least 20% by 2030) by improving agricultural and forestry yield and mobilisation, introducing optimised irrigation and/or cultivation methods and new/better fertilisers; in 2020 15% of currently underutilized low fertility arable land will be put back into production (35% by 2030);
- Maintain and further develop a competitive and knowledge intensive rural economy in Europe based on biorefineries resulting in new, higher and more diversified revenues to farmers and cooperatives and creating additional skilled jobs of which more than 80% will be in rural areas;
- The biomass available will be fully utilized and cycles will be closed. Protein isolation and valorisation from additional biomass processing will result in 15% reduced import of protein (e.g. soy) for feed in Europe in 2020 (50% by 2030). Optimisation of soil fertility programs including recovery and use of phosphate and potassium, will lead to a 10% reduced import of those components for fertilizers (25% by 2030);
- Industrial deployment of bio-based chemicals, biomaterials and advanced biofuels, so that 20% of the chemicals and materials production in Europe will be bio-based by 2020 (30% to 2030); By 2020 2% of Europe's transport energy needs by sustainable advanced biofuels (25% in 2030);
- Realise a new generation of bio-based materials and composites, allowing the production of better-performing components for application in several industries. In 2020, the market supplied by bio-based polymers and composites at comparable quality-price ratio compared to the fossil alternatives will be 3 times higher than today (factor 10 in 2030); increased consumer acceptance, concerted policy and labelling, awareness of bio-based products as well as recycling and reuse will have an important contribution to the improved market penetration.

All these strategic objectives will have a significant contribution to the European objective of achieving **20%** reduction in greenhouse gas emissions in 2020 (compared to 1990 levels). Additional quantifiable research, demonstration and deployment objectives have already been identified in the SIRA.

Finally, the expected impact of a Bio-based Industries JTI should also be considered in the global context. A number of important world regions have already developed bioeconomy policies similar to the EU Bioeconomy Strategy (Bioeconomy Blueprint in the US, China's 12th 5-year plan, India and others), marked e.g. by massive investments in first-generation biofuels and bioproducts. Europe now needs to overcome the first-mover advantage of these regions in order to maintain and enhance industrial competitiveness on the basis of technological leadership, focusing on second- and third-generation technologies.

Taking into consideration the challenges and objectives of the possible JTI together with the currently indicated industrial commitment of € 2.8 billion, a budget of up to € 1 billion from Horizon 2020 would be requested for this initiative. This would represent a ratio of private/public funding of approximately 3:1. The part of the Horizon 2020 budget concerned would be allocated from the societal challenge "Food Security, Sustainable Agriculture, Marine and Maritime Research, and the Bio-Economy" and from the challenge "Secure, Clean and Efficient Energy". In terms of budget to be provided, a balance of 70:30 between the bioeconomy and the energy challenge is proposed. It is envisaged that roughly 1/3 of the total budget will be allocated to research activities, including projects addressing cross-sectorial issues (e.g. standardization), whereas the remaining budget will finance demonstration activities, aiming to integrate R&D into new value chains, bringing technology close to commercial scale. The latter aspects are still under discussion between the industrial participants.

In view of building a robust impact assessment by mid-January 2013, Directorate E aims to receive from the industry group before the end of 2012:

- A finalised SIRA
- An agreed and realistic set of quantifiable objectives
- Additional confirmation of the financial commitment of € 2.8 billion together with a balanced budget allocation between research, demonstration and deployment activities

The outcome and progress regarding the aforementioned points will have a definitive effect on the finalisation of the IA. In the meantime, the industry has confirmed establishing a legal entity at the beginning of December 2012. A spokesperson was officially appointed on 12 November 2012.

How to increase EU-12 involvement

Experience of implementing the FP7 KBBE theme (including industrial biotechnologies) shows a significant difference between EU12 participants and those from the EU15 of 10% vs 70% in selected proposals. EuropaBio in 2008 organised roundtables in 7 MS of the EU12 to discuss the development of the bio-based economy through research and innovation programmes and to identify ways to further develop industrial biotechnology in these countries. In essence, lack of appropriate research and industrial infrastructures, lack of awareness and lack of policy support were considered main factors for developing a bio-economy and industrial biotechnology in particular.

Nevertheless, currently the potential of the EU12 in terms of contributing to an EU wide supply of sustainable biomass is substantial. Agricultural and forestry production levels are relatively low and leave significant room for progress. The Bloomberg New Energy Finance study estimates the

potential of agricultural & forestry residues & municipal waste across the EU27 and concluded that 25.4 % of the total EU potential is located in the EU12, with Poland ranking in 5th position overall in the EU. For reasons of efficiency, biorefineries need to be close to the biomass sources.

The EU12 could not only benefit from being purely biomass suppliers, thus creating additional income opportunities for farmers and foresters, but even more so in terms of establishing the required industrial conversion/biorefinery capacities. This approach would allow addressing difficulties of the EU12 to identify a sufficient number of economically viable projects that can "absorb" the resources available to them in rural development funds. The concept of "Smart Specialisation" in this regard would allow EU12 Member States to build on their individual strengths, e.g. in terms of agriculture and forestry and in terms of fermentation know-how, giving priority to related investments in R&D&I. DG REGIO in cooperation with DG RTD and other services is currently preparing a "Practical Guide for Managing Authorities", assisting managing authorities (MAs) in integrating green growth into the regional research and innovation strategies for smart specialisation, thus making optimal use of the EU Structural Funds to address issues of sustainable energy, eco-innovation and eco-system and nature protection.

Independent from or as a follow-up to the JTI, the development of a network of biorefineries in EU12 Member States can provide an excellent opportunity to leverage the necessary structural funds under the EU Cohesion Policy, creating new sources of employment and economic growth.

In addition, JTI information and brokerage events will need to be organised in cooperation with the industry, specifically focusing on the EU12.

How to ensure simplification

Currently, a JTI "Bio-based Industries" is considered a simplification by the industrial partners in terms of:

- It provides a platform presenting the medium- to long-term objectives and other stakeholders
- It provides a platform to allow building the necessary links and alliances across value-chains. Industries reported that the current initial engagement in a possible JTI has already brought together partners which were completely disassociated previously, facilitating cooperation and value creation, and increased return on investment.
- Focusing on innovation: although the support provided under FP7 was appreciated, the current focus on innovation by the JTI facilitates additional industrial investment into demonstration and first-of-its-kind facilities. In the absence of a JTI instrument in the EU, such investments are currently being diverted to other world regions.
- Possible adoption of the JTI would send out a strong political signal, facilitating and simplifying access of industries to additional public and private funding sources, like the EIB and venture capitals.

Furthermore, a JTI "Bio-based Industries" would engage in making use of the opportunities for simplification provided on the basis of the new Financial Regulations, simplified PPP bodies, staff regulations, common support structure for all JTI's, harmonized provisions for audit and control etc. However, as this JTI would be a new instrument without predecessor, no relevant experience has been gathered by the industry involved.

Directorate E is actively involved in the Director's working groups on issues related to public-private partnerships, and aims to make use of the conclusions of these groups to the largest extent possible, in particular in relation to any simplifying measures put forward.

Concrete proposals for private sector involvement

A number of aspects could have an impact on the scale of the private sector involvement, including also non-budgetary aspects as follows:

- Standards and standard development for bio-based products constitute an essential element during their commercialisation, to inform clients and the general public about product features in an appropriate and consistent language. This important element forms an integral part of the proposed JTI SIRA.
- Facilitating public procurement could be enabled not only on the basis of aforementioned product standards, but also on the basis of public services having available the knowledge and necessary information for decision making. Thus, this forms another important element, which would be pursued in discussions with industry.
- Openness for additional industrial members of the JTI. This is an element already considered by the industrial partners in the current set-up, also to be included in the SIRA. It is evidenced by the increasing numbers of industrial partners (now 40, up from 33 in March 2012), but also by the willingness of the industries to base the implementation of the SIRA on open calls for proposals.
- Finally, the scope of the activities foreseen under the SIRA will have a decisive impact on the involvement of the private sector and of particular players therein.