Advisory Group

FP7 – Theme 2
“Food, Agriculture and Fisheries, and Biotechnology”

Brussels, 17 November 2009

Meeting Report

Introduction and Background

This was the 9th meeting of the FP7 Advisory Group (AG) for Theme 2, “Food, Agriculture and Fisheries, and Biotechnology”. It was the third time the AG met after the 50% turnover of its members that has taken place in November 2008. The meeting was attended by 18 out of the total 27 AG members, with 9 of them (50%) listed as speakers in the meeting agenda.

The agenda of this AG9 meeting was structured around a number of strategic topics for the European “Knowledge-Based Bio-Economy” (KBBE) research, as identified by the previous AG meeting (AG8), as well as the needs of the Commission services involved, i.e.,

- Strategic priorities for the KBBE Work Programme (WP)
- Modification of WP2010 and reflections for WP2011
- Focus on specific topics (Bio-Waste, Marine and Maritime RTD)
- Strengthening the socio-economic aspects of KBBE research.

It must be noted that, even more than with AG8, the timing of this meeting has stressed the strategic value of AG’s mission of providing advice to the European Commission, specifically with respect to the preparation of the Work Programme of this FP7 Theme for the year 2011 and beyond. This timing is also affected by the appointment of a new Director, the new EU Commission, and the preparation for a new EU 2020 strategy and a new KBBE vision, all these factors acting under conditions of global financial and broader crisis.

The present report is based on the presentations and discussions during the AG9 meeting. Its main parts correspond to the main sessions of the meeting. As with the previous AG meetings, the reporting style employed in this document focuses on the essential and potentially useful elements that came up during the whole-day meeting. These should be viewed in the frame of the main critical remarks and recommendations of the AG on the KBBE research activities and plans, which were formulated and discussed in the previous AG meetings (see the Meeting Reports of AG7, pp. 3 and 6, and AG8, pp. 2-3):
Main AG Recommendations

- Linking more closely KBBE research to that of the other related EU-funded RTD fields (environment, energy, and health);
- Strengthening social and economic aspects within KBBE research;
- Enhancing (eco)systems thinking, especially to improve understanding of complex bioeconomy phenomena, including sustainability issues;
- Need for an interdisciplinary approach across the programme mainlines;
- Focus on a small number of strategic research topics and aspects; major examples include (a) bio-waste as a biomass resource, and (b) international collaboration linked to growth economics;
- More emphasis on the targeted development of appropriate tools, especially in fast growing fields like bio-informatics.

Future Priorities of KBBE Research

In her presentation, the new Director, Maive Rute, described the following set of eight priority lines for the future deployment of Theme 2 RTD activities:

1. Launching a new KBBE vision and action plan;
2. Promoting ERA through KBBE actions;
3. Building stronger links with other EU policies;
4. Research addressing the “Grand Challenges” of our time (climate change, sustainability, food safety, social inclusion and health, future of oceans);
5. Knowledge generation and science excellence;
6. Strengthening the innovation potential of industry and society;
7. Promoting public engagement; and
8. Enhancing international cooperation.

A simple reading of this ambitious priority list reveals an interesting dialogue with the above listed AG recommendations; several of the priorities follow closely the AG points (e.g., no. 3 and 8), others are linked with AG discussions (no. 1, 2, 7), and finally some attempt a bold move beyond (no. 4, 5 and 6).
In the discussion that followed the Director’s presentation, the AG members offered a number of comments, almost all aiming at supporting the feasibility of the new KBBE action plan, and including

- The high stakes for immediate action, but with a long-term perspective, in the key EU bioeconomy fields;
- The paradoxes of the so far experience with biotechnologies, e.g., hard science depending upon soft science;
- The need to create a new culture for enterprises (business ethos) and the public (life styles, habits), e.g., with respect to non-food biotech;
- The demand for a shift of the public debates character, from emotional to informed;
- The key role of research as a major tool for the success of “green” solutions; and
- The catalytic role of the EU-funded research, in conjunction with the growing importance of Joint Programming.

Towards the 2011 Work Programme

According to the presentation by Line Matthiessen, the shift from WP2010 to WP2011 will be characterised by a focus on five priority topics, corresponding to the “Grand Challenges” of the new strategy (see above, no. 4). These topics will be accompanied by a number of horizontal issues, which correspond to the other KBBE priority actions listed above, thus making apparent the immediate implementation of the new plan.

WP2011 PRIORITY TOPICS (P):

P1. Primary production and climate change
P2. Sustainable and competitive bioeconomy
P3. Food security
P4. Social inclusion and health
P5. Oceans of the future

WP2011 HORIZONTAL ISSUES (H):

H1. Cross-thematic cooperation
H2. Coordination with Members States
H3. Strengthening excellence and capacities
H4. International cooperation
H5. Promoting SME aspects
H6. Addressing socio-economic aspects
COMMENTS BY AG MEMBERS:

- The KBBE represents a new/emerging space for innovation.

- The key role of KBBE research, especially during this transition period, will be to “unlock” the potential of bio-world in all its dimensions.

- A major *modus operandi* consists in better understanding of the complex phenomena involved, to be used as a basis for the identification of the critical knowledge “gaps”, to be followed by the targeted filling-up of those “gaps.”

- Typical examples of complex KBBE areas that could benefit from such an approach include
  - Low-input farming,
  - Soil biosystems, where fertility is only part of their functions,
  - Nutrition disorders, e.g., obesity, malnutrition, “hidden hunger”,
  - Functional food properties and role of antioxidants,
  - Sustainable introduction of non-food crops, linked to biorefineries,
  - Landscape ecology, where aesthetics could be served by bioculture.

- Environmental biotechnologies represent an especially privileged (to the degree of serving as a possible flagship) KBBE research field *cum* toolbox, as therein the search for efficient bio-solutions can be accompanied by the satisfaction of the sustainability requirements.

- The design of environmentally compatible bio-solutions could draw upon the emerging potential of novel RTD areas and approaches, such as those of the phyllo-sphere, rhizo-remediation, and the pollution “fight-or-flee” microbial systems.

- As bioeconomy issues concern key sectors, such as agriculture, forestry, fishing, aquaculture, food, bioenergy etc., KBBE research could play a significant role in social and economic development, thus representing a key opportunity field for international cooperation.

- Social acceptance is part of the sustainability criteria, so for KBBE to be able to respond to societal concerns, and assess the (real or imaginary) threats and risks lurking around the corner, research on S&T topics should be accompanied by appropriate information, communication and crisis-management components.
Focus on Specific KBBE Research Topics

(a) Bio-Waste

The particular research topic was first identified during AG7 (see the AG7 Meeting Report - also the table on p. 2 of this report). It was then (see the AG8 Meeting Report) discussed and enriched during AG8 with inputs from all the involved EC DG Research services (Environment, Energy, and KBBE). It was finally elaborated as a detailed AG proposal by an ad hoc Working Group, chaired by this AG’s Vice-chair, Lene Lange (work also included in the AG8 Meeting Report).

During AG9, the strategic interest in this topic was re-confirmed and a number of additional comments were offered by AG members in support of their recommendation:

- The key target of research on this topic is the concept of bio-valorisation, i.e., adding value to a waste stream within a bioeconomy context.

- The topic is characterised by both intrinsic and extrinsic complexity, including the problem of a proper name, not bearing the negative sign of “waste”.

- For various reasons, including semantics and taxonomics, the topic is neither “sexy” to mainstream researchers, nor prestigious for academic careers.

- On the other hand, the topic of Bio-Waste is linked to a number of other strategic issues and questions; thus by addressing it Theme 2 research opens up new bioprocess pathways and illuminates dark bioeconomy “corridors.” In particular,
  - There are two general bio-valorisation approaches, i.e., recycle vs. reprocessing, depending on the flow of the bio-waste value chain;
  - The recycle approach links bio-wastes with soil biosystems, the latter being considered for more than their fertility functions;
  - Organic farming can especially benefit from the systematic utilization of plant wastes;
  - The spectrum of the possible bio-waste uses includes bioenergy vectors, along with biochemical and biomaterial ones;
  - The role of fibre in the latter category is significant, as lignocellulosic/fibrous bio-wastes represent a highly promising type of feedstock for sustainable bio-valorisation;
Bio-wastes can be also part of industrial ecology systems, as well as sources for eco-innovation;
Strategies and methods for prevention of generation of wastes along the whole production-use chain are necessary for increased sustainability of the bioeconomy.

For success, bio-valorisation schemes have to meet the challenge of satisfying at the same time several, usually conflicting objectives: reliable feedstock supply, high product quality, low process cost, positive public attitude (acceptability), and environment-friendly behaviour, including energy and water needs.

To increase public awareness, affect social attitudes, and enhance the attraction of bio-wastes as research and career options, relevant subjects should be introduced into school and university curricula.

The AG has decided that its Bio-Waste Working Group, chaired by Lene Lange, with members Eckhard George, Michel Griffon, Thomas Ohlsson, and Patrick Sorgeloos, will be available for the support of the Commission services in the process of an eventual introduction of the Bio-Waste topic into WP2011.

(b) “Oceans of the Future”

This research topic was proposed by the Commission, as one of the WP2011 priorities (see above, P5, p. 3). The topic can be fully addressed only through synergies with several thematic fields and areas. The term “ocean” could be extended to include the Mediterranean and the Black Sea, so that the strategic dimension of the topic for Europe becomes more evident.

With respect to the KBBE agenda, we can distinguish between Marine and Maritime research, the former referring to marine biology and biotechnology, and the latter to the various aspects of the exploitation of the sea and its resources. Of particular interest, e.g., in a sustainability-related perspective, is the question of integration between the marine and the maritime components.

The AG has agreed with the importance of this topic, and has decided to put together a Working Group to support the Commission services in their future work in that direction. The members of this WG are Patrick Sorgeloos (chair), Gudrun Marteinsdottir, and Karl Andreas Almas. In addition to the fields covered by the expertise of these AG members (i.e., aquaculture, fisheries/marine biology, as well as technology and exploitation), other fields are also involved. Therefore, we recommend to the Commission to identify two contact
persons within DG Transport and DG Energy, who would provide assistance to this *ad hoc* WG if necessary.

(c) Coordination and Planning

As the topics selected for the first round of the Joint Programming Initiative are of relevance for Theme 2 and the KBBE, it would make good sense if this AG could have a meeting with the AGs of DG Enterprise, Energy, and the Environment to further explore the idea of cross thematic calls recommended by this AG.

During AG9, the outlook and importance of timely preparation of inputs to FP8 was briefly addressed, along with the group’s inputs to WP2011 and the KBBE strategy. Of relevance for such an input to FP8 would specifically be a discussion on possible modification of instruments to facilitate better integration of the users of the knowledge generated (industries, SMEs, and the public sector).

Socio-Economic Constraints – New Member States

The AG has decided to focus its discussion concerning socio-economic aspects on the case of the, so called, “new” (i.e., the last 12) Member States and their lagging-behind pattern with respect to participation in KBBE research. The discussion benefited significantly from the active role in the discussion of AG members from new Member States (Poland and the Czech Republic), as well as from non-Member States (Norway and Turkey).

The pattern covers almost all aspects of the research life-cycle: number and quality of proposals, human resources, partnerships and consortia, infrastructure, funding, leadership and coordination, evaluators and strategic views. The phenomenon is clearly linked with the socio-economic situation in those countries, thus it is at the socio-economic level that it can be analysed and addressed.

A key reason is that scientific and research jobs are not attractive to those societies, with the possible exception of women in some cases. So, it is with the new generation that things might really change. This puts the emphasis on education and training, along with public perceptions and attitudes typically affecting the younger audiences through the channels of their families, their peers, and the powerful mass media.
With respect to socio-economic perceptions, there is a sharp difference between “old” (i.e. the first 15) and “new” Member States (MS): in the former, the dominant concerns are those of society, whereas the latter are dominated by economic concerns.

As a result, societal expectations, as expressed in the respective dominant “narratives” (i.e., the stories with visions about the world) differ significantly: in the “old” MS, the story is about sustainability, in the “new” MS about market success. Bridging this gap is a real challenge for research policy makers.

A number of instruments were considered by the AG for immediate action to reverse the dominant trend and positively affect organic, bottom-up growth. These include useful tools, such as Summer Schools and SME-oriented programmes. In addition, it was noted that the rate of convergence appears to correlate with that of the development in the STS (=Science, Technology and Society) field, i.e. with building of skills in the technological intelligence practices, obviously affecting positively RTD management.

In conclusion, the AG has agreed that, appropriate policies should, above all, support scientific and technological excellence, a process that needs time, which seems to be the primary factor in this case.
ANNEX

10 + 1 Reasons for Bioeconomy to be Part of the EU 2020 Strategy

On 25 November 2009, i.e., 8 days after the AG9 meeting, the Advisory Group members were informed by the Commission services about the Commission proposal for a new “EU 2020” strategy, towards “a new sustainable, smarter, greener social market”,¹ and the opening of a public consultation period until 15 January 2010.

As the topic was not discussed by the AG as such, the members could respond only an individual basis. What follows is the response of the AG Chair, which is annexed to this report in order to circulate among the AG members, in preparation of a discussion during the next meeting, AG10. Although the views expressed hereby are personal, they are based on the past and ongoing work of this Advisory Group, as summarized in its meeting reports.

A careful examination of the Commission documents shows that bioeconomy is not part of the new EU 2020 strategy, neither explicitly, nor implicitly. This can be confirmed by a quick, computer search for key words (number of times used in parenthesis), revealing the domination of economy (50 times), followed by energy (13), the environment (7), and digital (6). Almost all key terms connected with bioeconomy in a KBBE or other approach are not used at all: bio- (0), food (0), feed (0), nutrition (0), fish (0), forest/wood (0), plants (0), animals (0), water/aqua- (0), life (0), land/soil (0), agriculture/rural (1).

The term “bioeconomy,” according to its current Commission use,² includes all industrial and economic sectors that produce, manage and otherwise exploit biological resources (and related services, supply or consumer industries), such as agriculture, food, fisheries, forestry etc.

Based on the work of the KBBE Advisory Group, the Knowledge-Based BioEconomy (or KBBE) should be part of the new EU 2020 strategy for a number of serious reasons, as follows:

I. HIGH STAKES: Most of the key bioeconomy sectors are of a high strategic interest for Europe and the world (e.g., food, farming, plant and animal health, forest), thus raising the stakes for immediate action and/or inaction, particularly at the policy level.

II. CHANGE DYNAMICS: The "winds of change" threaten the status quo in almost all EU bioeconomy fields, acting on both supply and demand, and destabilizing century-long equilibria; see, e.g., the effects of emerging economies on the management of global bioresources.

III. INNOVATION POTENTIAL: Unlocking the potential of the bio-world constitutes a major challenge for European researchers and innovators, offering opportunities for synergistic and accelerated development of novel products, services, tools, methods and solutions.

IV. ENVIRONMENTAL ASPECTS: Making good use of the growing reservoir of biological knowledge, and especially the environmental biotechnology’s potential, could lead to a symbiotic development of environment-friendly applications in all bioeconomy areas.

V. CLIMATE CHANGE: The bio-world offers its unique properties for the mitigation of the climatic change vectors, e.g., greenhouse gases, through photosynthetic, and other biological pathways, along with the generation of climate-neutral solutions, e.g., clean bioenergy/biofuels.

VI. SOCIO-ECONOMIC ASPECTS: Keeping a bioeconomy perspective facilitates matching of the rapidly changing societal needs and concerns to an also changing production base; at the same time, bioeconomy represents a great source of future employment.

VII. BUSINESS OPPORTUNITIES: Along with the support of several KBBE-related European industries, e.g., food, pharmaceuticals, biochemicals, forest-products, a bioeconomy strategy could open the way to new “waves” of SMEs and other business, and new breeds of entrepreneurship.

VIII. POLICY COORDINATION: The critical but extremely complex task of coordinating regional, national and other policies concerning all bioeconomy sectors and their interactions can only be performed within a unified, KBBE-like policy frame.

IX. EUROPEAN VALUE: The progress of European integration (economic, social, political, other) cannot stop at the gates of the biological world; by their nature, bio/eco-systems resist to artificial borderlines, so their rational management could benefit from a unified EU KBBE frame.
X. GLOBAL DEVELOPMENT: The majority of the less developed countries depend upon their bioeconomies for survival and growth, e.g., cash crops, food and fibre exports; research on bioprocesses that could upgrade such feedstocks are of high importance for sustainable development.

XI. A SMART MOVE: Intelligence is one of the functions of biological systems, in most cases being integrated to the life-cycle of the organisms or the operation of ecosystems; therefore, in order to target a really smart EU economy, the Commission should also take advantage of the bioeconomy-embedded intelligence.

NOTE: After circulation of this report among AG members for their approval, some of them have contributed by proposing additional items to the above list, such as the following:

- SUBSTITUTION: Fossil, non-sustainable organic resources, products and conversion chains can be replaced by sustainable bio-based resources, products and processing chains; this represents a key step for Europe to reach its GHG reduction goals, and lower its dependence upon fossils (oil, coal and gas) and the associated economic and political risks of their supply.