BUSINESS PLAN

CEN/TC 411
Bio-based products

EXECUTIVE SUMMARY

Business Environment

- A recent study[1] estimates that, by 2025, over 15 % of the three trillion dollar global chemical sales will be derived from bio-derived sources. Yet another study highlights that over 90% of the annual global plastic production of 270 Mio tons is technically feasible for substitution by bioplastics.
- As of 2005, bio-based products already accounted for 7% of global sales and around 77 billion Euro in value within the chemical sector. The EU industry accounted for approximately 30% of this value[2].
- Parties involved:
  - Producers of biobased (end-) products
  - Suppliers of raw materials and intermediates
  - Research institutes
  - Public & Business-Interest NGO's
  - Certifying bodies and test laboratories
  - Government

Benefits

- As part of the Lead Market Initiative coordinated action in this sector is needed to to rapidly bring visible advantage for Europe's economy and consumers.
- Standards are seen as essential elements in aggregating initial demand, in particular for new bio-based products.
- Initiates a more energy- and resource-efficient production at industry level.
- Coherent concept for bio-based product standardization and designation.

Priorities

- To develop standards concerning terminology, methods, criteria, guidance and tools, applicable to bio-based products, taking into account – but not necessary limiting to – the CEN/BT/WG 209 report "Bio-based products".
- Accelerating the development of the European market for bio-based products by developing a consistent terminology for bio-based products.
- Development of standards for horizontal aspects, including sampling, bio-based content, application of LCA, sustainability criteria for biomass.
- Developing (a) certification scheme(s) for bio-based products, identifying which characteristics can/should be assessed and how they should be reported.

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1 Vijayendran, B., 2010: Biobased chemicals: technology, economics and markets (White Paper).

2 Mandate M/492 "MANDATE addressed to CEN, CENELEC and ETSI for the development of horizontal european standards and other standardisation deliverables for bio-based products"

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1 BUSINESS ENVIRONMENT OF THE CEN/TC

1.1 Description of the Business Environment

The following political, economic, technical, regulatory, legal, societal and/or international dynamics describe the business environment of the industry sector, products, materials, disciplines or practices related to the scope of CEN/TC 411, and they may significantly influence how the relevant standards development processes are conducted and the content of the resulting standards:

The creation of a European bio-economy is expected to open the way for innovations and effective technology transfer, aiming to include all industries and economic sectors that produce, manage and otherwise exploit biological resources as well as related services from the supply or consumer industries. These activities are in line with the European strategy on life sciences and biotechnology[1] and is expected to promote competitiveness of European agriculture and biotechnology, seed and food companies and in particular high-tech SMEs, while improving social welfare and well-being. A European bio-economy cannot compete on a global level by delivering only basic agricultural commodities, but needs to build on European strengths:

- excellent science, technology and industry base to deliver innovations;
- biotech companies have developed genetically engineered crops used world-wide;
- leader in innovative food technologies and products;
- leader in innovative animal breeding technologies;
- strong chemical and manufacturing industry base.

Participants in the chain – farmers, industry, regulators and consumers – need to cooperate to actually make the bioeconomy work.

Innovation strategy
Innovation policy in the European Union now[2] applies a wide range of policy instruments to create a more favourable business climate for innovative goods and services. In the next few years, the implementation of the lead market initiative (LMI) will be an important aspect of the implementation of the EC's innovation strategy.One of the important features of the action plans (one for each lead market area) is to speed up the implementation of standardisation work. Both the Lead Market Initiative (LMI) Communication and the Report[3] from the Ad-hoc Advisory Group for Bio-based Products in the framework of the European Commission's Lead Market Initiative concluded that standards may facilitate the development of Lead Markets. Standards should preferably be performance-based, yet technology-neutral. Regarding bio-based products standards are seen as essential elements in aggregating initial demand, in particular for new bio-based products.

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1 The United Nations Convention on Biological Diversity defines biotechnology as: "Any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use."

2 Communication "Putting knowledge into practice: A broad-based innovation strategy for Europe" of September 2006

3 Ad-hoc Advisory Group for Bio-based Products in the framework of the European Commission's Lead Market Initiative (2009), Taking Bio-Based From Promise To Market - Measures to promote the market introduction of innovative bio-based products, Report.

Sustainability
The European Commission stresses the need for environmental and other sustainability criteria for European standards and other standardisation deliverables to be considered by taking into account that final end products might be made up of a mix of bio-based and non bio-based components. The first criteria for sustainability were laid down by the EC in the Renewable Energy Directive (2009/28/EC), but are only obligatory for biofuels and bioliquids. Discussion on indirect land-use effects on one hand and regarding availability of biomass for the greater biobased economy on the other hand, might lead to a further need for harmonization and for presenting evidence that biobased products are from sustainable renewable origin.

1.2 Quantitative Indicators of the Business Environment

The following list of quantitative indicators describes the business environment in order to provide adequate information to support actions of CEN/TC 411:

- A recent study[1] estimates that, by 2025, over 15 % of the three trillion dollar global chemical sales will be derived from bio-derived sources. Yet another study highlights that over 90% of the annual global plastic production of 270 Mio tons is technically feasible for substitution by bioplastics. Many of these bioproducts would be manufactured in bio-refineries by the deployment of rapidly emerging industrial biotechnology.
- As of 2005, bio-based products already accounted for 7% of global sales and around 77 billion Euro in value within the chemical sector. The EU industry accounted for approximately 30% of this value[2].
- Sales of products made by biotechnological processes in 2012 are expected to be around 135 billion Euro = 7,7% of total chemical sales[4].
- Estimates of the ad-hoc advisory group for bio-based products [5] for 2012 include:
    - The most important sub-segments are expected to be active pharmaceutical ingredients, polymers and cosmetics[6].
    - In particular, the active pharmaceutical ingredients, with 33,7% of global chemical sales, are expected to be the chemical segment with the highest sales percentage of products produced using biotechnological processes.
    - For specialty chemicals produced using biotechnological processes it is expected that Asia achieve the highest sales globally followed by Europe and North America.
    - It is predicted that Europe will be strong in sales in the sub-segments active pharmaceutical ingredients, polymers and fibres, cosmetics and organic chemicals.
    - The sub-segments inorganic substances and fertilizers and gases are predicted to see the lowest sales.

2 BENEFITS EXPECTED FROM THE WORK OF THE CEN/TC

In the area of bio-based products, an industry self-commitment concerning biodegradable and compostable polymer products exists since 2004, while another one for “Bio Hydraulic Oils” as part of bio-lubricants is current being prepared. These consist of a voluntary certification and labelling scheme and commitments are seen as the starting point towards a harmonised internal market for bio-based products. It was concluded that a coherent concept for bio-based product standardisation is needed:

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[4] Source: CEFIC Facts & Figures January 2009, Market evaluation of FESTEL CAPITAL from May 2009.

[5] Ad-hoc Advisory Group for Bio-based Products in the framework of the European Commission’s Lead Market Initiative (2009), Taking Bio-Based From Promise To Market - Measures to promote the market introduction of innovative bio-based products, Report.

[6] In the meantime, the EC has indicated (also via the Mandate M/492) that the important sectors are as of today bio-polymers, bio-lubricants, bio-solvents and bio-surfactants.

- To enable turning innovative ideas into new products and services.
- To help address European as well as global societal challenges such as combating climate change and decreasing dependence on fossil resources.
- To speed up the development and deployment of the technologies needed to meet these societal challenges.
- As part of the EU Lead Market Initiative coordinated action in the biobased sector is needed to to rapidly bring visible advantage for Europe's economy and consumers'
- To present a clear distinction between biobased and biodegradable in relation to product functionality and sustainability[7]
- To prevent a proliferation of all type of claims and labels on biobased products in order to present a clear picture for consumers on one hand and for public procurement on the other hand.
- To assist the European Commission in addressing the 'Knowledge Based Bio-Economy', where 'key enabling technologies' and bio-based products will help to shape Europe's industrial future.

3 PARTICIPATION IN THE CEN/TC

All the CEN national members are entitled to nominate delegates to CEN Technical Committees and experts to Working Groups, ensuring a balance of all interested parties. Participation as observers of recognized European or international organizations is also possible under certain conditions. To participate in the activities of this CEN/TC, please contact the national standards organization in your country.

4 OBJECTIVES OF THE CEN/TC AND STRATEGIES FOR THEIR ACHIEVEMENT

4.1 Defined objectives of the CEN/TC

The main objective of the TC is to develop standards for bio-based products covering horizontal aspects. This includes a consistent terminology for bio-based products, sampling, bio-based content, application of and correlation towards LCA and sustainability of biomass used, and guidance on the use of existing standards for the end-of-life options. The work will take into account the CEN/BT/WG 209 report "Bio-based products" and the Mandates M/491 and M/492.

As the TC's focus is horizontal standards, there is no intention to present threshold or default values. This is to be done by specific product standards or by political decision. The TC intends to develop classifications and guidance (on for instance product declarations).

The standardization deliverables in the short term are descriptive standards or test methods at horizontal level in the form of an umbrella standard consisting of multiple parts.

In parallel, the TC will develop Technical Specifications (TS) and Technical Reports (TR) for bio-solvents, in relation to the biodegradability, product functionality, impact on GHG emissions and the amount of different renewable raw materials and will conduct a review of already existing standards for bio-solvents. Apart from this vertical product standardization, the TC may well in the mid-term derive from its horizontal package standards for other type of intermediates and final products, such as bio-chemicals.

A certification scheme for bio-based products, identifying which characteristics can/should be assessed and how they should be reported, is to be developed as well.

[7] Biodegradability is a useful property of products for certain applications. Furthermore, an LCA should be applied to determine the gap in benefit between re-use of the material versus biodegradability.

4.2 Identified strategies to achieve the CEN/TC's defined objectives.

Being given part of the M/491 Mandate for bio-solvents, it is logical to check the horizontal standards' aspects on solvents. As for bio-plastics and bio-lubricants work and concepts have already been developed, the TC needs to align (or at least assess) its standards with relevant CEN/TC 249, respectively CEN/TC 19 documents.

Working groups

There will be several working groups needed. At least one working group will cover the work on bio-solvents. Development of horizontal standards for bio-based products might be covered by more than one working group. Where necessary a group will be given the task to align the work within the TC or with other TC's.

Prioritization of projects

The following projects (in random order, see also Table 1) are the first priority for the Technical Committee:

- Project 1, Overview of standards:

Based on input by the Members the list of standards as in CEN/TR 16208 will be updated and a base document for the working groups will be established.

- Project 2, Terminology:

Standardization of general terminology applicable to bio-based products, taking into account CEN/TR 15932 and the Technical Report assembled by CEN/BT/WG 209/TG 1.

- Project 3, Bio-solvents aspects in relation to bio-based products:

Developing CEN Deliverables for product characteristics of bio-solvents, based on the conduction of a review of already existing standards for bio-solvents, including assessment of the need for their revision, including functionality and biodegradability.

- Project 4, Determination of bio-based carbon content:

Standardization of a method determining the bio-based carbon content of products, taking into account prEN 15440, CEN/TS 16137, ASTM D6866 and ASTM D6852.

- Project 5, Bio-based product specific sustainability criteria:

Standardization of sustainability criteria applicable to bio-based products, taking into account the work of CEN/TC 383 (prEN 16214) and the EU-Prosuite project.

- Project 6, Bio-based product specific Life-Cycle Analysis guidance:

Standardization of life cycle analysis guidance applicable to bio-based products, taking into account the work of ISO/TC 207, the EU-Prosuite- and EU-Calcas-Projects and other relevant ongoing research and tools.

- Project 7, Determination of bio-based content:

Standardization of a method determining the bio-based content of products, other than bio-based carbon content.

- Project 8, Specific declaration and certification tools:

Standardization of declaration and certification tools applicable to bio-based products, taking into account the work of CEN/TC 249/WG 17.

Use of source documents
The following national, regional or international source documents will be used if applicable:

- Report “Accelerating the Development of the Market for Bio-based Products in Europe”, composed in preparation of the Communication “A Lead Market Initiative for Europe” (COM(2007) 860 final).
- EC Communication “A Lead Market Initiative for Europe” (COM(2007) 860 final)
- EC Evaluation report on the Lead Market Inititiative
- The work of CEN/TC 249/WG 17, Biopolymers
- Report of CEN/BT/WG 209 "Bio-based products" on the earlier programming mandate M/429 on Bio-based Products.
- International Reference Life Cycle Data System (ILCD) Handbook (and Guidance handbook for good practice in Life Cycle Assessment, developed by the Joint Research Centre and DG Environment).

Co-operations and Liaisons
At least the following technical committees need to be contacted for exchange of information:

- CEN/TC 19/WG 33 "Bio-lubricants",
- CEN/TC 249/WG 17 “Biopolymers”,
- CEN/TC 276 “Surface Active Agents” (M/491 bio-surfactants part),
- CEN/TC 343 "Solid recovered fuels"
- CEN/TC 383 "Sustainably produced biomass for energy applications",
- ISO/TC 61, "Plastics",
- ISO/TC 122/SC 4 "Packaging and environment"
- ISO/TC 146/SC 1/WG 26 "Biomass and fossil derived CO2"
- ISO/TC 207, "Environmental management",
- ISO/PC 248, "Sustainability criteria for bioenergy"

Expected deliverables and indicative timetable
For the development of different European standards and other standardization deliverables the requests by Mandate M/491 and M/492 are taken as a basis. From thereof roadmap in Table 1 is derived, noting that the Mandates can be answered by intermediate deliverables, such as CEN/TS and CEN/TR.

Table 1: Roadmap for bio-based products standardisation

No.	Title	Deliverable	End Month
1	Bio-based products – Overview of standards	N-doc	
2	Bio-based products – Part x: Terminology	EN	42
3	Bio-solvents aspects in relation to bio-based products	EN	60
4	Bio-based products – Part x: Determination of bio-based carbon content	EN	36
5	Bio-based products – Part x: Specific sustainability criteria	EN	52
6	Bio-based products – Part x: Specific Life-Cycle Analysis Guidance	EN	52
7	Bio-based products – Part x: Determination of bio-based content	EN	42
8	Bio-based products – Part x: Specific declaration and certification tools	EN	60

Specific needs for pre/co-normative research
A lack of standards hinders market uptake of bio-based products, both in consumer markets and in public procurement. Standards are needed for, among others, the determination of bio-based content (carbon and biomass), product functionalities and biodegradability. These standards are in some cases to be supported by research leading to the following outcomes:

- Development of a standard test method , including all validation data, for bio-based carbon content measurement in different bio-based products.
- Development of a standard test method and testing scheme for determination of biomass content that is not solely dependent on C14 analysis. This methodology should be applicable in different bio-based products, including as a minimum, bio-polymers, -lubricants, -surfactants, and –solvents.
- Identification and resolution of functionality related bottlenecks with the view to adjusting, developing, harmonising and validating test methodologies considering the use of priority bio-based products, i.e. bio-polymers, -lubricants, -surfactants, and –solvents.
- Development of standard test methods, including all validation data, for completion into a generally applicable European Standard for the testing of the biodegradability of bio-solvents.

Bodies to be associated
To ensure that the activities are co-ordinated in a way to create a consistent and coherent framework at the international level, notably with regard to other relevant activities in relevant European Research Projects and the EU-RRM-Group, the TC needs to keep close contact with the European Commission.

The standard development activities are to be undertaken in cooperation with the widest possible range of interested groups, including:

- the Joint Research Centre of the European Commission,
- OECD Activities
- consumers' interests (ANEC),
- environmental protection (ECOS),
- workers interest (ETUI-REHS),
- SMEs (NORMAPME),
- raw material producers (COPA-GOGECA)
- biomaterial producers (European Renewable Raw Materials Association, ERRMA, European Biomass Industry Association, EUBIA, European Biomass Association, AEBIOM, the European Oleochemicals And Allied Products Group, APAG, and Fediol)
- bio-industry (European Chemical Industry Council, CEFIC, and European Association for Bioindustries, EuropaBio),
- European Solvents Industry Group (ESIG),
- International Association for Soaps, Detergents and Maintenance Products (AISE),
- European Bioplastics,
- Comité Européen des Transmissions Oléohydrauliques et Pneumatiques (CETOP) and the European Lubricating Grease Institute (ELGI),
- relevant activities under the Europe Innova Initiative,
- relevant European Technology Platforms (ETPs)
- and others to take part in the development of the programme.

4.3 Environmental aspects

Obviously, a major point in standardization for bio-based products is evaluating their environmental impact. Aspects such as for instance biodegradability, compostability, recyclability,

renewable material use, water pollution, life-cycle analysis and sustainability (all falling under the term resource intelligence) are topics within the scope of the TC.

5 FACTORS AFFECTING COMPLETION AND IMPLEMENTATION OF THE CEN/TC WORK PROGRAMME

Factors that could negatively impact the completion or business community acceptance and use of the CEN committee's standards include:

- Expert resources are not sufficiently available (for certain projects), because the prime attention should be horizontal methods, where the majority of the experts might have a product-focus;
- Specific expertise for a project is lacking, which could affect the project’s development as well as the credibility of the resulting standard in the business community;
- Validation of a test method is dependent upon funding being available to the necessary pre/co-normative research and Round Robin work;
- Legal/regulatory issues such as uncertainties regarding a possible EC Directive and the further detailing of the Ecolabel, which in turn may necessitate modifications of the content and target dates for projects in the work program;
- The work of the EU-Prosuite project is delayed;
- Lack of financial support to carry out (part of) the work.