This newsletter provides up-to-date information on activities related to biotechnology at the Organisation for Economic Co-operation and Development (OECD). It is mainly intended for OECD staff and delegates to OECD meetings who are already familiar with certain aspects of the Organisation’s work. We hope that it is also informative for the wider biotech community.

The contents of this newsletter have been provided by those members of the OECD secretariat who are responsible for the various activities. The secretariat can be contacted via the e-mail address: icgb@oecd.org. Alternatively, individuals can be contacted via e-mail using the form firstname.lastname@oecd.org (See Who’s Who list at the end of the newsletter).

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ABOUT OECD’S INTERNAL CO-ORDINATION GROUP FOR BIOTECHNOLOGY (ICGB)

The Organisation for Economic Co-operation and Development (OECD) and its member countries have been addressing issues related to biotechnology since 1982.

From that time, biotechnology has had an increasing impact on the programmes of different sectors at OECD such as: agriculture and trade; environment; science, technology and industry. So in 1993, the Internal Co-ordination Group for Biotechnology (ICGB) was established to facilitate co-ordination among these sectors.

Peter Kearns, Head of OECD’s Biosafety Programme, is the Executive Secretary of the ICGB. He is assisted by Bertrand Dagallier, Biosafety and Novel Foods and Feeds Safety, who is the editor of the ICGB Newsletter.

Contacts: Peter Kearns, Bertrand Dagallier (ENV/EHS)
2014 Green Growth and Sustainable Development Forum:  
addressing the social implications of green growth

The 2014 Green Growth and Sustainable Development Forum (GGSD Forum), to be held at the OECD on 13-14 November 2014, will address the distributional impacts of implementing green growth strategies, including potential impacts on labour market, income and households. It will start with an opening discussion on “inclusive green growth in an increasingly unequal world”, to provide an overview of current trends in inequality and the broader social context in which green growth policies are implemented. Two Day 1 plenary sessions will follow, to examine the impact of green growth policies on households from the perspective of energy sector reform, and labour and skills implications of green growth. Day 2 will be dedicated to a series of parallel sessions, which will address aspects of Day 1 themes in more detail, with a focus on knowledge gaps and priorities for future work.

Registrations are now open online.

Country-Specific Green Growth Strategies

Building on the general framework developed in the 2011 Green Growth Strategy, the OECD continues to mainstream green growth into its national and multilateral policy surveillance exercises, to provide policy advice that is targeted to the needs of individual countries.

The investment policy review of Myanmar (March 2014) includes discussion on green infrastructure. The recent Environment Performance Reviews (EPRs) for Sweden (June 2014) and Columbia (April 2014) contain an evaluation based on green growth indicators alongside a set of recommendations in this field. Green growth assessment is integrated into all OECD Economic Surveys, which are available at http://www.oecd.org/eco/surveys/.

OECD Green Growth Indicators 2014

Green Growth Indicators 2014 was released on 24 June 2014, to update the 2011 publication Towards Green Growth: Monitoring progress.

A first set of green growth indicators was proposed in the 2011 publication. This report updates and extends those indicators. It charts the progress that countries have made in four areas: the transition to a low carbon, resource efficient economy; maintaining the natural asset base; improving people’s environmental quality of life; and implementing policies for, and realising the economic opportunities associated with, green growth. The overall picture that emerges is mixed: while countries have individually and collectively made some progress in the transition to green growth, much remains to be done.
Greener skills and jobs

Greener skills and jobs, published on 13 February 2014, emerged from a joint OECD and Cedefop forum on green skills. The aim of the forum was to gather researchers, government advisers, employment and policy analysts, and other social partners on skills development and training needs for a lower carbon economy. The publication presents papers from the forum and suggests that the role of skills and education and training policies should be an important component of the ecological transformation process. Green skills will be required in all sectors and at all levels in the workforce as emerging economic activities create new (or renewed) occupations. Structural changes will realign sectors that are likely to decline as a result of the greening of the economy and workers will need to be retrained accordingly. A successful transition will only be possible if workers can flexibly adapt and transfer from areas of decreasing employment to new industries.

Web site:  [www.oecd.org/greengrowth](http://www.oecd.org/greengrowth)
Contact:  Nathalie Girouard, Justine Garrett (ENV/GG)

GLOBAL FORUM ON BIOTECHNOLOGY

The Global Forum on Biotechnology, established in 2010, is one of 16 Global Forums created by OECD Committees. Global Forums are not official OECD bodies (except one1), but are best described as broad communities or networks of stakeholders in the areas of responsibility of one or more Committees. OECD Committees have an interest in hearing the views of these stakeholders, but their capacity to accommodate (non-Member) Partners as Participants or Associates is limited.

The OECD Global Forums provide platforms for peer learning and policy dialogue on issues which require interaction with Partners world-wide. Global Forums can also promote multidisciplinary and horizontal approaches beyond the scope of any single Committee and foster partnerships with other intergovernmental organisations.

OECD Global Forums bring together government officials, policy analysts, business leaders, academic experts, researchers and various other stakeholders. Many Global Forum meetings are major events, attracting large numbers of participants from different regional and cultural backgrounds. They help to create active networks of policy makers in Member and Partner economies, to build consensus on what are the most effective policies and to identify “next-generation” issues.

The principal functions of Global Forums are to:

- Help the Committees identify relevant issues, including newly emerging ones;
- Promote a convergence of views on the Committees’ outputs among a broad range of Members and Partners;
- Ensure that these outputs are known and used among these stakeholders;
- Share best practices in the implementation of the results.

1 The Global Forum on Transparency and Exchange of Information for Tax Purposes differs from all other Global Forums: it is a separate OECD Body in which many countries and economies outside the OECD’s Membership participate on an equal footing with OECD Member countries.
The Global Forum on Biotechnology supports the activities and networks in the field of biotechnology developed by the Committee for Scientific and Technological Policy and the Joint Meeting of the Chemicals Committee and the Working Party on Chemicals, Pesticides and Biotechnology. For instance, it provides the adequate framework to support the participation of several delegates from non-Member countries in the plenary meetings of the Working Group on Harmonisation of Regulatory Oversight in Biotechnology, as well as the Task Force for the Safety of Novel Foods and Feeds.

**Web site:** General information on the Global Forums: [www.oecd.org/globalrelations/forums](http://www.oecd.org/globalrelations/forums)  
(French: [www.oecd.org/relationsmondiales/forums](http://www.oecd.org/relationsmondiales/forums))

**Contact:** Jan Schuijer (SGE/Global Relations Secretariat)

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**THE OECD - WORLD BANK - CERA PARTNERSHIP**  
**FOR BIOSAFETY RISK ASSESSMENT AND REGULATION**

In the 2008 World Development Report, the World Bank recognized the global importance and potential of agricultural biotechnology, as well as the importance of establishing appropriate regulatory frameworks to ensure safe and beneficial implementation of these new technologies. Many countries have identified a need for additional technical capacity and expertise as they implement their biosafety regulatory systems and, in response to this need, the Partnership for Biosafety Risk Assessment and Regulation (the Partnership) was funded by the Development Grant Facility of the World Bank in 2012. The Partnership is a collaboration between the Organisation for Economic Cooperation and Development (OECD), the World Bank, the ILSI Research Foundation’s Center for Environmental Risk Assessment (CERA), and developing country governments that have not before been engaged at the OECD.

The objective of the Partnership is to strengthen the technical capacity of involved developing countries in establishing a harmonized and scientifically-sound biosafety system. One important element for achieving this goal is to involve these countries in the activities of the OECD Working Group on Harmonisation of Regulatory Oversight in Biotechnology. The Working Group has 20 years of relevant experience in environmental risk assessment of transgenic organisms that becomes available for them. In parallel, the OECD Task Force for the Safety of Novel Foods and Feeds offers them tools for assessing the safety of foods and feeds derived from transgenic organisms. To date, the Working Group and the Task Force have developed 68 consensus documents that describe characteristics relevant for risk assessment of plants, animals, microorganisms and traits (see relevant sections below). The benefits of the program extend to existing OECD member and observer countries as well. The cultivation of transgenic crops, and the trade and use of biotech products is certainly expanding beyond the OECD countries and participation of non-OECD members is essential in this global context. It widens the focus of the Working Group and the Task Force towards tropical and sub-tropical agriculture, brings new and different perspectives and experiences, and has resulted in new projects on important tropical crops (e.g. cassava and cowpea).
The Partnership program has allowed countries from Asia, Africa, South America and Eastern Europe to participate in OECD biosafety work, as well as other activities and events that were initiated or sponsored by the Partnership. These include a recent CERA workshop offering hands on experience in the testing for impacts to non-target organisms, and the South Asia Biosafety Conference held in India in September 2013. Partner country participants from Kenya, Colombia and Bangladesh attended the 2014 meetings of the Working Group and the Task Force, and funds have been set aside to support future participation from Paraguay at next year’s meeting.

The OECD/World Bank/CERA Partnership has a fixed term of three years, but aims to establish permanent global networks so the exchange of expertise on biosafety continues after the formal end of the current program.

Contacts: Bertrand Dagallier, Peter Kearns (ENV/EHS)

HARMONISATION OF REGULATORY OVERSIGHT IN BIOTECHNOLOGY

The OECD’s Working Group on Harmonisation of Regulatory Oversight in Biotechnology (WG-HROB) deals with the environmental risk/safety assessment of transgenic plants and other genetically engineered organisms. The work aims to ensure that the types of elements used in biosafety assessment, as well as the methods to collect such information, are as similar as possible amongst countries. This improves mutual understanding and harmonised practice, which in turn, increases the efficiency of the biosafety assessment process, limits duplication of effort, while reducing barriers to trade.

The WG-HROB participants are mainly officials responsible for the environmental risk/safety assessment of products derived from modern biotechnology. Observer delegations and invited experts are associated with the work, including Argentina; Colombia, Russian Federation; FAO; UNEP; Secretariat of the Convention on Biological Diversity (SCBD); and Business and Industry Advisory Committee to OECD (BIAC). Key partner economies (Brazil, China, India, Indonesia, South Africa), other interested countries (such as Bangladesh, Kenya, Philippines) and the African Biosafety Network of Expertise (NEPAD-ABNE, based in Burkina Faso) also collaborate actively given their increasing use of biotech products and breeding activities on tropical and sub-tropical species. Their participation is supported by the OECD's Global Forum on Biotechnology.

The publication of Consensus / Guidance Documents remains a major output of the programme. They constitute a set of practical tools for regulators and biosafety assessors dealing with new transgenic plant varieties and organisms, with respect to environmental safety. To date, 49 Consensus Documents have been published. They address a range of subjects including the biology of crops (recently on cassava), of trees (eucalyptus will be published soon), of micro-organisms as well as selected traits that have been introduced in plants. These documents also deal with key issues in the context of environmental risk assessment, including low level presence of transgenic plants in conventional seed and commodities. They are available through the OECD website (www.oecd.org/biotrack).

A new project has been launched on mosquito Aedes aegypti, of which engineered strains offer promising possibilities to fight against dengue fever and other diseases for which the species is a major vector. The project is co-led by Mexico, Brazil and CERA. A Workshop held in Mexico in May 2014 allowed experts to review the situation, share the latest information and start developing a new Consensus Document on the biology of the mosquito Aedes aegypti. This will be the first document of the Series to be focused on an insect.
Other work under development or being discussed by the WG-HROB are as follows:

- **Crop species:** the biology of tomato, sorghum and cowpea;
- **Key issues in the context of environmental risk assessment:** 1) Considerations for the release of transgenic plants, and 2) New Plant Breeding Techniques.
- **Micro-organisms:** 1) the proceedings of the Conference on Environmental Uses of Micro-organisms held in March 2012, and 2) the use of micro-algae for production purposes which is an important emerging trend; and
- **Animals:** the biology of 1) Atlantic salmon, and 2) Mosquito as above detailed.

The WG-HROB is also managing the BioTrack Product Database, in collaboration with the Task Force for the Safety of Novel Foods and Feeds (see section "BioTrack Online" below).

**Future event:**


**Recent publication:**

- *Consensus Document on the Biology of Cassava (Manihot esculenta Crantz)* (2014)

**Upcoming publications:**

- *Consensus Documents on the Biology of*
  - *Eucalyptus* (to be issued soon)
  - *Sorghum*;
  - *Tomato*
- *Proceedings of the OECD Conference on the Environmental Uses of Micro-Organisms (held in March 2012)*

**Web site:** BioTrack Online [www.oecd.org/biotrack](http://www.oecd.org/biotrack) (Source: Dr. Ismail Rabbi, IITA)

**Contacts:** Takahiko Nikaido, Bertrand Dagallier, Peter Kearns (ENV/EHS)

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**SAFETY OF NOVEL FOODS AND FEEDS**

The OECD Task Force for the Safety of Novel Foods and Feeds (Task Force) addresses aspects of the safety assessment of foods and feeds derived from genetically engineered crops. The work aims to ensure that the types of elements used in risk/safety assessment, as well as the methods to collect such information, are as similar as possible amongst countries. The approach is to compare transgenic crops and derived products with similar conventional ones that are already known and considered safe in their use based on recognised experience. Harmonised methods and practice, as well as share of data are facilitated through the Task Force activities.

**Consensus Documents**

The main output is the set of *Consensus Documents* on compositional considerations of new varieties of specific crops (which can enter in the "novel" foods and feeds production). These documents compile a common base of scientific information on the major components of crop plants: key nutrients; toxicants;
anti-nutrients and allergens where relevant. Other publications deal with general aspects to facilitate harmonisation in safety assessment. These documents constitute practical tools for regulators and risk assessors dealing with new transgenic varieties, with respect to human food and animal feed safety. To date, 22 Consensus Documents have been published on major crops and mushrooms, the animal feedstuffs, as well as the molecular characterisation of plants derived from modern biotechnology developed in common with the WG-HROB. This "Novel Food and Feed Safety" Series complement the WG-HROB publications on environmental safety.

The Consensus Document on oyster mushroom (Pleurotus ostreatus) was issued in 2013, and a project has started on apple (Malus domestica) under the leadership of Germany. In addition, work continues on common bean (Phaseolus vulgaris, lead country Brazil), as well as revision led by Japan of the previously-published document on rice (Oryza sativa) that will be consolidated in coming months in collaboration with IRRI Philippines. Other activities are being contemplated, including composition of other plant species such as cucurbits, and also animal compositional data, novel feed ingredients (Canada lead country), information sharing on new plant breeding techniques initiated by the Netherlands.

A compendium of the Consensus Documents on novel foods/feeds safety produced by the Task Force since its establishment is being prepared, for publication in 2014.

Outreach and Engagement of Non Member Economies

The Task Force has increasingly involved the experience, scientific knowledge and interests of non-member economies, which allows it to address a wider range of food and feed products of global interest. The development of activities on tropical and sub-tropical species was made possible through active cooperation with some of these countries and targeted expertise from international research organizations, FAO, WHO and others. South Africa, Brazil and Thailand, for example, were actively involved in the drafting of Consensus Documents on compositional considerations for cassava, sweet potato, papaya or sugarcane, while Brazil is leading the new project on common bean.

The Task Force benefits also from the expertise of specialists from Argentina, Bangladesh, China, India, Latvia, Indonesia, Kenya, Moldova, Philippines, the Russian Federation and the African Biosafety Network of Expertise (NEPAD-ABNE, based in Burkina Faso). Such participation is supported by the World Bank/CERA/OECD Partnership on Biosafety (see section above) and the OECD's Global Forum on Biotechnology.

Future events:


Recent publication:

- **Consensus Document on Compositional Considerations for New Varieties of Oyster Mushroom (Pleurotus ostreatus):** Key Food and Feed Nutrients, Anti-Nutrients and Toxicants (2013)

Upcoming publications:

- **Consensus Document on Compositional Considerations for New Varieties of Common Bean (Phaseolus vulgaris)**
- **Revised Consensus Document on Compositional Considerations for New Varieties of Rice (Oryza sativa)**
- **Safety Assessment of Novel Foods and Feeds Derived from Transgenic Crops – OECD Consensus Documents – Volumes 1 & 2. This compendium will collate the key documents produced by the Task Force between 2002 and 2013**

Contacts: Bertrand Dagallier, Takahiko Nikaido, Peter Kearns (ENV/EHS)

Web site: BioTrack Online [www.oecd.org/biotrack](http://www.oecd.org/biotrack)
The BioTrack Online information system is a mechanism by which the Working Group on Harmonisation in Biotechnology and the Task Force for the Safety of Novel Foods and Feeds make publicly available the outputs of their work, especially their Consensus/Guidance Documents described in sections above.

**Biosafety - BioTrack**

BioTrack Online offers also a public access to the Product Database. This database allows regulatory officials to easily share basic information on transgenic products derived from the use of modern biotechnology (mainly crop plants) and approved for commercial application in terms of food, feed or environmental safety. The database is updated, on a voluntary basis, by authorities of countries participating in the OECD biosafety activities. Products are listed with unique identifiers, and the information includes common/scientific names of the host organism and introduced genes, the events and traits, the regulatory elements and relevant links regarding approvals for release and use in countries. Information provided by Australia, Japan, Mexico and the United States on new or updated entries was added to the Product Database in 2013 and early 2014, totalling now about 200 products of transgenic crops and flowers from 14 species. Some technical improvements were brought to the database early 2013: addition of a new column to collect information on “Method for detections-Reference materials”, enlargement of the “Unique Identifier” column for covering multiple stacked-event products, additional browsing “by trait” and broken hyperlink checker.
Progress has been made on co-operation between the OECD’s Product Database, the CBD Biosafety Clearing-House and the recently-established FAO GM Food Platform, for interoperability between these web-based systems and facilitating the exchange of information on safety assessment of transgenic organisms and foods. This project responds to a request from the Codex ad hoc Task Force on Food Derived from Biotechnology, and a Memorandum of Cooperation signed between OECD and the Secretariat of the Convention on Biological Diversity. In recent meetings, the Parties to the Cartagena Protocol on Biosafety recommended to strengthen the OECD-CBD collaboration, and for the OECD to extend the existing system of Unique Identifiers (UI) currently designed for transgenic plant varieties (the OECD UI system is used by main public as well as industry databases and documentation all over the world), to transgenic micro-organisms and animal species. This suggestion will be followed-up.

BioTrack Online also contains the regulatory contacts of OECD member countries and other stakeholders involved in biosafety and novel food/feed safety.

**Web site:** BioTrack Online [www.oecd.org/biotrack](http://www.oecd.org/biotrack)
Products Database [www.oecd.org/biotrack/productdatabase](http://www.oecd.org/biotrack/productdatabase)

**Contacts:** Takahiko Nikaido, Bertrand Dagallier, Peter Kearns (ENV/EHS)

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**Biodiversity Economics and Policy**

Biodiversity work at the OECD focuses on the economics and policies needed to promote the effective conservation and sustainable use of biodiversity and ecosystem services. It includes areas such as biodiversity valuation, the use of economic instruments and other incentive measures, and development and distributional issues. This work also supports the Convention on Biological Diversity (CBD). It is undertaken under the OECD Working Party on Biodiversity, Water and Ecosystems (WPBWE), a subsidiary body of the Environment Policy Committee (EPOC).

Biodiversity is fundamental to sustaining life, providing critical ecosystem services, such as food security, water purification, nutrient cycling, and climate regulation that are essential to support human well-being and economic growth. Despite the significant economic, social and cultural benefits provided by biodiversity and ecosystem services, biodiversity at the global level is on the decline. The *OECD Environmental Outlook to 2050: The Consequences of Inaction*, released in 2012, projects that without renewed policy efforts, a further 10% of the world’s biodiversity will disappear between now and 2050. In the context of biodiversity, the Outlook identifies four areas where further action is critically needed. These are: reforming environmentally harmful subsidies; scaling up private sector engagement in biodiversity; improving knowledge and data for more effective biodiversity policy; and mainstreaming biodiversity into other sectors and policy areas of the economy.

Recent OECD work focused on *Scaling-up Finance Mechanisms for Biodiversity*. Released in May 2013, this publication examines the opportunities for scaling-up finance for biodiversity across six so-called “innovative financial mechanisms” as identified by the Convention on Biological Diversity. These are: environmental fiscal reform; payments for ecosystem services; biodiversity offsets; markets for green products; biodiversity in climate change funding; and biodiversity in international development finance. The book provides an overview of the general purpose and applicability of each financing mechanism, reviews the level of finance that each has mobilised, and considers the extent to which each could be scaled up. It then examines the key design and implementation features that need to be considered for each mechanism so as to ensure they are environmentally effective, economically efficient and distributionally equitable. The possible safeguards and enabling conditions that are needed to successfully implement these mechanisms are also examined.
The publication drew insights from an international expert workshop, held in Montreal, Canada on 12 May 2012, on “Finance Mechanisms for Biodiversity: Examining Opportunities and Challenges”. Jointly convened by the OECD, World Bank, GEF, and the European Commission, together with Sweden and India, it brought together more than 80 participants from governments, development agencies, UN organizations, non-governmental organizations and other experts.

On-going biodiversity work at the OECD is currently focusing on Biodiversity Offsets. This work examines good practice in the design and implementation of biodiversity offset (including biobanking) programmes. Drawing on the literature on biodiversity offsets and on case studies across developed and developing countries, the work will analyse the role of biodiversity offsets in delivering the conservation and sustainable use of biodiversity in economic development projects. It will examine the contribution of environmental and social safeguards, including the mitigation hierarchy, and highlight the key design and implementation features that should be considered in the development of environmentally and cost-effective biodiversity offset programmes. An OECD international expert workshop on this issue, bringing together relevant stakeholders to exchange experiences, was convened in Paris on 6-7 November 2013.

Other on-going work on biodiversity at the OECD includes work on Biodiversity Policy Response Indicators and on The Role of National Ecosystem Assessments in Policy Making. The former work aims to contribute to the discussion on types of policy response indicators that may be suitable for monitoring progress towards the Convention on Biological Diversity’s 2011-2020 Aichi Biodiversity Targets. More specifically, the report examines possible indicators for Aichi Target 3 (on incentives) and Target 20 (on resource mobilisation). A summary of preliminary OECD work on Biodiversity Policy Response Indicators was presented at the Working Group on Review of Implementation meeting in Montreal, Canada 16-20 June 2014. The latter work examines experience from the development of NEA’s across different countries to provide insights on how their impact on policy can best be enhanced.

**Future event:**

**Recent publications:**
- OECD (2013), *Scaling-up Finance Mechanisms for Biodiversity.*
- OECD (2012), *OECD Environmental Outlook to 2050: The Consequences of Inaction.* Includes a chapter on Biodiversity.
- OECD (2010) *Paying for Biodiversity: Enhancing the Cost-Effectiveness of Payments for Ecosystem Services*

**Upcoming publications and reports:**
- Biodiversity Offsets: effective design and implementation
- Biodiversity Policy Response Indicators

**Web site:** [www.oecd.org/env/biodiversity](http://www.oecd.org/env/biodiversity)

**Contact:** Katia Karousakis (ENV/CBW)
When the mandates of the current Working Party on Biotechnology (WPB) and the Working Party on Nanotechnology (WPN) expire at the end of 2014, the work of these two bodies will continue under the auspices of a new body, the Working Party on Biotechnology, Nanotechnology and Converging Technologies (BNCT).

This merger recognises the importance of developments in biotechnology and nanotechnology and many of the exciting developments that are occurring at their interface with other scientific and technological areas. Over the first biennium of its existence, 2015-16, the work of the BNCT will focus on three broad areas:

- Enabling the next industrial revolution – harnessing technologies for social and economic benefit;
- Enabling and adopting new technologies and new developments in technology to address health challenges;
- The impact and measurement of key, enabling, emerging and converging technologies based on the life and physical sciences.

Biomedical innovation for healthy ageing, Alzheimer's disease and other dementia

Neurodegenerative dementia – Alzheimer's disease in particular – represents a significant challenge for public health systems worldwide. The ageing of society and the increasing prevalence of dementia drive the demand for biomedical research leading to safe and effective therapies. To date, efforts to develop neuroprotective and curative drugs against dementia have failed, but biomedical technologies are enabling researchers to study the underlying biochemical and molecular mechanisms and to shed light on persistent questions about the onset and development of Alzheimer's disease. Governments and agencies can play a key role in the creation of a global vision and the development of integrated policy and regulatory frameworks that reflect the unique needs of the disease.

The traditional linear drug development models demonstrate low efficiency. Despite significant discoveries in neuroscience and genetics and high financial investments, the number of new, innovative therapies based on biomedical technologies entering the market has not been increased sufficiently. Key barriers in research and health innovation for Alzheimer's disease mirror the major challenges stakeholders are facing.
in other complex, chronic diseases: 1) high investment costs and technical risks in research and clinical development; 2) lengthy processes from discovery research to regulatory approval; 3) intellectual property issues outside the precompetitive space; and 4) scattered knowledge and infrastructure. The situation for Alzheimer's disease is further complicated by an inadequate understanding of the disease pathology, a lack of validated diagnostic tools, and regulatory frameworks that are not meeting the needs of a highly complex environment. There is a growing understanding amongst public and private entities that the pharmaceutical industry cannot be solely responsible for most of the drug discovery and development in a disease area characterised by limited resources and high risks. Multi-stakeholder partnerships have been evolving to share resources, benefits and risks throughout the value chain of product development for Alzheimer's disease and other dementia.

Over the past few years, the Working Party on Biotechnology (WPB) has conducted work in a number of areas related to innovation in biomedical research and health innovation for healthy ageing (see list of publications below). Ongoing projects address the policy challenges of biomedical research and health innovation for Alzheimer's disease and other dementia.

- **Project on “Government approaches for biomedical innovation in Alzheimer's disease and other dementia”**
  
  The multifactorial nature of Alzheimer's disease necessitates the use of complex and cutting edge therapies that are increasingly based on emerging biomedical technologies. Context-specific policies for biomedical research and health innovation can foster both the use of emerging biomedical technologies and the realisation of new therapies for Alzheimer's disease. A questionnaire has been completed by representatives of national governments, ministries or their agencies to collect information on government approaches and best practices to support biomedical innovation in Alzheimer's disease and other dementia. Preliminary results confirm the critical role of policy makers and regulators in supporting basic, translational and clinical research through long-term funding programmes, the development of human resources, infrastructures and collaborations. Local public and private research institutions require tailored policy frameworks to support coordination, general management and information sharing between stakeholders and on project level. Evidence indicates a need to translate global declarations and guidance on dementia into national strategies. Even though most countries do not have a dedicated national plan on healthy ageing and dementia as yet, biomedical and clinical research agendas for Alzheimer's disease and other dementia represent priority areas in larger programmes on neurodegenerative and chronic diseases. Countries also point out the gap between the high investment costs for neurodegenerative disease research (for example the set-up of brain banks, neuroimaging facilities, national registries and databases for clinical research) and the limited availability of financial resources.

- **Project on “Public-private partnerships in biomedical research and health innovation for Alzheimer's disease and other dementia”**
  
  The diversity of stakeholders (and their scientific expertise) in Alzheimer's disease is enormous. Their interests range from basic biomedical and discovery research to clinical development and regulatory review. This project examines the roles and opportunities of key stakeholders in strategic collaborations aiming to address persistent bottlenecks in biomedical innovation for Alzheimer's disease. There are three main objectives to this part of the project on Healthy Ageing: 1) identifying the main initiatives that are being developed that can foster collaborative research for Alzheimer’s disease and other neurodegenerative diseases; 2) identifying the factors that have affected progress in these initiatives; and 3) identifying good practice and drawing lessons for future use. This work has been conducted in cooperation with the OECD Working Group on Innovation and Technology Policy (TIP). It is in line with recommendations of the G8 Dementia Summit Declaration to strengthen collaboration for innovation and cross-sector partnerships focused on social impact investment, new care and prevention models, and academia/industry partnerships. The work has been informed by a literature review and information on public-private partnership case studies provided by members of the Working Party on Biotechnology (WPB).

Preliminary results confirm that public-private partnerships can facilitate a reform of traditional research and health innovation models towards more efficient innovation strategies. Stakeholders can work together to establish appropriate organisational structures and policy frameworks to develop effective business models for Alzheimer's disease. As a neutral environment, public-private partnerships can help to
accelerate the development of effective therapies for Alzheimer’s disease by supporting the missions of individual stakeholders, incorporating their strengths, responding to their needs and allowing individual stakeholders or stakeholder groups to respond flexibly to specific opportunities. This can help to
1) strengthen discovery research and the delivery of quality drug candidates for translational and development programmes, 2) reduce failure during late-stage development, 3) manage costs and risks, 4) enable early communication between innovators and regulators, and 5) develop the required policy and regulatory frameworks that combine the needs of all stakeholders.

- Workshop on “Regulatory innovation for Alzheimer’s disease and other dementia – reforming regulatory frameworks to accelerate research and health innovation”, 11-12 November 2014, Lausanne, Switzerland

The Lausanne workshop will explore issues relating to clinical research and medicines regulation in Alzheimer’s disease and other dementia. The workshop aims to identify key barriers in biomedical research and health innovation – in particular the challenges of current regulatory frameworks throughout the value chain of product development. Discussion will focus on how stakeholders can work together to accelerate the translation of research findings into efficient clinical research programmes and effective therapies.

Recent Publications:


Contact: Hermann Garden, Jacqueline Allan (STI/STP)

OMICS-TECHNOLOGIES FOR BETTER FOOD AND NUTRITION

OECD/HUGO Workshop on “Genomics for Better Food and Nutrition”, Geneva 29 April 2014

The event took place in the context of the Conference of the Human Genome Meeting 2014. The objective of the workshop was to review some of the latest advances in omics-technologies in relation to food, in both OECD and emerging economies, and to look at the associated policy implications.

The workshop was organised around five expert talks and discussions on issues such as the importance of using biodiversity to produce better crops and the use of omics-technologies to create food security through advanced breeding technologies or through unlocking the potential of orphan crops. Given the fact that the climate change is leading to less favourable growing conditions for traditional crops, the focus on orphan crops is likely to become more important for food security in the future. Yields from both traditional and orphan crops may be increased substantially via the use of modern breeding technologies and the adoption of strategies designed to tackle devastating crop diseases and pest attacks. Omics-technologies have a critical role to play if these goals are to be reached in an efficient way. The same is true if livestock breeding is to advance efficiently. Omics-technologies such as epigenomics can also be used for the...
detection of dietary effects on human health, or for the identification of biomarkers of malnutrition. Given the importance of early life nutrition for health later in life, this is an important application area for omics-technologies.

Web site:  www.oecd.org/sti/biotechnology

Contact:  Kathleen D’Hondt, Jacqueline Allan (STI/STP)

INDUSTRIAL BIOTECHNOLOGY

Council Recommendation on Assessing the Sustainability of Bio-based Products

The draft Council Recommendation was prepared by the Task Force on Industrial Biotechnology at the request of the Working Party on Biotechnology. Following public consultation on the draft Recommendation during July and August 2012, including its distribution to 250 individuals/organisations, from whom 118 comments were received, the draft Recommendation was amended. The final version of the Recommendation passed through the Executive Committee on July 11, 2012 and was approved by Council on July 17 for publication and dissemination.

The Council recommends that countries develop and implement national frameworks for assessing the sustainability of Bio-based Products taking into consideration environmental, economic and social impacts throughout the whole life cycle (cradle-to-grave). The Recommendation highlights the importance of building consensus amongst stakeholders including SMEs, ensuring international consistency of approaches; using assessment methodologies and indicators that are science-based, making data publicly available and promoting awareness of the sustainability aspects of Bio-based Products.

The Council Recommendation can be downloaded from:  http://webnet.oecd.org/OECDACTS/Instruments/ListBySubjectView.aspx

Recent Publications:


See also:

  http://www.cell.com/trends/biotechnology/abstract/S0167-7799(13)00027-9
- http://www.cell.com/trends/biotechnology/abstract/S0167-7799(13)00028-0

Policies for Bioplastics in the Context of a Bioeconomy

The production of bioplastics is in a phase of transition and relative growth. The earliest bioplastics were the biodegradable plastics, designed to fulfill simple packaging roles that would address a growing waste
management dilemma. Mastery of some of the bio-based versions of bulk thermoplastics has created both new applications and market opportunities. However, like their fossil-based equivalent counterparts, the bio-based thermoplastics are non-biodegradable. In terms of end-of-life, the lack of biodegradability is offset to some degree by their ability to enter the established recycling infrastructure.

Bio-based production is now at a stage where new biorefineries are announced frequently. A lot of attention has been given to integrated biorefineries, where the higher margins and lower production volumes of bio-based chemicals are envisaged alongside the production of bulk bio-based fuels, with their lower margins. This economic model is one employed in petrochemical refineries, where petrochemicals account for a significant proportion of the profits despite the higher demand for gasoline and diesel. Plastics represent a fascinating middle ground – with higher production volumes than fine, specialty and commodity chemicals, but much lower volumes than fuels. In the operation of integrated biorefineries, the production of bio-based plastics is likely to be critical.

The biggest obstacle to the proliferation of bioplastics has been their higher price in comparison to fossil-based plastics. The production technologies for the latter are very mature and there are massive economies of scale in fully amortised plants. In comparison, bioplastics are at an early stage of technological development and there are limited economies of scale, though there is plenty of scope to improve production efficiency. One avenue for this involves exploiting developments in the emerging discipline of synthetic biology, which have great potential benefits for all sectors of bio-based production.

With these matters in mind, it was timely for the OECD to conduct an examination of the policy regimes being employed to support bioplastics production and to identify gaps where public policy may remove barriers, but in cost-efficient manner for the taxpayer. A report summarising the work conducted during 2011-2012 was published in 2013.

Recent Publication:

The Role and Impact of Science and Technology Policies on Bio-Based Chemicals and Bioplastics
Work conducted on industrial biotechnology during the 2013-2014 biennium looks in some detail at the policy regimes that have been established internationally in biofuels, bioenergy and bio-based chemicals and plastics. It identifies large policy gaps for bio-based chemicals and plastics and recognises that these products provide greater opportunities for job creation and greater value-added than biofuels and bioenergy. It suggests ways in which these policy gaps could be addressed in a cost-effective manner. A report summarising the results of all work carried out on bio-based chemicals and bioplastics is scheduled for the end of the 2013-14 Biennium.

Three major policy trends directly concerning bio-based production are emerging:

1. Bioeconomy strategies are becoming more numerous at the national and regional levels;
2. Industrial biotechnology roadmaps are emerging; and
3. The first synthetic biology roadmaps have been produced or are in progress.

There has been much research into integrated biorefineries, and the first models exist. At these facilities, it is envisaged that biofuels and bio-based chemicals and plastics will be produced. It is also possible that bioenergy will be used to power these biorefineries. However, it has long been realised that bio-based chemicals and plastics have received hardly any public policy support, whilst there has been massive support for biofuels and, currently, there is massive support for bioenergy applications.

This support for biofuels and bioenergy is leading to competition on price for biomass that seriously disadvantages its use for chemicals and plastics. As one source of that biomass, it is worth noting that the market for wood pellets is now constrained by supply, not demand. Competition for that resource could result in large price increases.
The current policy regime will not allow chemicals and plastics to gain access to lower prices, while bioenergy applications will gain access as a consequence of feed-in tariffs, green electricity schemes and others. The Confederation of European Paper Industries has predicted that, partly due to the demand for wood for energy consumption by 2020, there will be a wood supply gap for material use between 2015 and 2020. This also conflicts with policies that relate to the cascading use of biomass.

There is a distinct possibility that the expensive biorefineries being built, often with public support through loan guarantees, may operate sub-optimally as bioeconomy strategies start to be implemented. The existence of markedly different policy regimes for biofuels, bioenergy applications and bio-based chemicals and plastics may also interfere with the implementation of industrial biotechnology roadmaps and synthetic biology roadmaps. The coordination of the trinity of key policies will be difficult enough, but will be made far more difficult if policy failure results in an inability to manufacture bio-based chemicals and plastics – the products that offer the greatest job creation prospects and highest added value. Many of these problems would disappear, however, if similar policy regimes were in place for biofuels, bioenergy applications and bio-based chemicals and plastics.

Scheduled work on the role and impact of science and technology policies in support of sustainable growth through industrial and environmental biotechnology envisaged a survey focusing on bio-based chemicals and bioplastics. Analysis of this survey, sent to the WPB and TFIB members in 2013, was discussed at the 24th meeting of the TFIB and the 34th Session of the WPB during June 2014. It indicated that, while the bioeconomy is still young, the strategies different countries have in place for biomass use for fuels and for the development of bio-based products and plastics have all been developed within the context of long-term visions. Bioeconomy strategies all address the use of biomass for sustainable production and generally refer to the cascading use of biomass. It is striking, however, that while almost all respondents have policies in place for the development of biofuels, less than half of them also have policies to support the development of bio-based products (chemicals and plastics).

In order to measure the impact of science and technology policies supporting the development of new bio-based products on economic activity, additional efforts will be required. There is a need for a common understanding of the term “bio-economy” and a shared appreciation of how its boundaries within the global economy can be defined. Moreover, in order to understand the impact of different policies on the development of the bioeconomy, generally agreed indicators will need to be defined.

**Upcoming Publication:**


**Web site:** [www.oecd.org/sti/biotechnology](http://www.oecd.org/sti/biotechnology)

**Contact:** Jim Philp, Kathleen D’Hondt (STI/STP)

**An International Workshop on “Sustainable Biomass Drives the Next Bioeconomy: A New Industrial Revolution?”**

This workshop was held on June 10-11, 2014, at OECD Headquarters, Paris. It explored critical topics relating to biomass sustainability. World experts from governments, academia and industry spoke on the sustainability topics that need to be addressed to enable the attainment of bioeconomy goals. Topics discussed were: methods and approaches to estimate biomass potential: how much can be grown sustainably?; geospatial landscape measurement techniques for biomass; food or non-food: which agricultural feedstocks for industrial uses?; measuring ILUC: problems and progress; sustainable biomass and marginal land; measurement tools: LCA, certifications and beyond; total factor productivity (TFP) and harmonisation; and mediating global conflicts concerning biomass.

**The International Forum on Genomics, Innovation and Economic Growth**

The International Forum on Genomics, Innovation and Economic Growth was held on 25-27 November 2013 in Mexico City. The forum was organised by the Human Genome Organisation (HUGO), the Global
Biotech Consulting Group, Genómica y Bioeconomia and CONACYT, in co-operation with the OECD. It brought together national and international speakers to discuss various ways in which genomics and associated technologies can contribute to sustainable economic growth in the future. The topics spanned many of the areas of work in the Programme of Work and Budget (PWB) for 2013-14: health; synthetic biology, industrial biotechnology and other areas essential to a bioeconomy, especially agriculture and fisheries and aquaculture. The topics discussed at the conference were relevant to discussions concerning the PWB for 2015-16.

SYNTHETIC BIOLOGY


Since that time, the OECD has launched a dialogue with experts and leaders in the field to identify some of the challenges confronting further development of the field and those areas where the OECD can make a positive contribution. In June 2011, the OECD held an expert meeting on synthetic biology in collaboration with the BioBricks Foundation and the SynBio 5.0 meeting at Stanford University. Based on that meeting, the OECD undertook work on the development of an infrastructure for synthetic biology; IPR access and sharing; and governance.

Work on infrastructures looked at the role of synthetic biology in the bioeconomy and challenges confronting the development of necessary infrastructures. This work was launched during the OECD/HUGO summit held in partnership with the Human Genome Organisation at its annual meeting in Sydney, Australia in March 2012.

Work on intellectual property focused on access and sharing and built on previous WPB work on “Knowledge Networks and Markets (KNM)” and on “Collaborative Mechanisms”. Specifically, it looked at challenges to the development of KNMs in synthetic biology. This work provided insights that should benefit other fields emerging as a consequence of technology convergence.

Emerging technology and converging technologies often represent challenges to existing governance structures, and it is important to ensure that existing structures do not constitute a barrier to innovation. The field of synthetic biology provides an example of technology convergence as it involves not just biology or DNA recombination, but other fields such as engineering, computational technology and nanotechnology. In many ways it also represents an emerging technology, one that is now moving beyond the modification of genetic material and towards the design and construction of new biological functions, structures and systems not found in nature. This work looked at potential barriers to the governance of innovations arising from developments in the field of synthetic biology and their relevance to other areas of technology convergence.

A synthetic report summarising the work on infrastructures, IPR and governance and highlighting emerging policy issues in synthetic biology was published in June 2014.

In 2013, a survey explored how synthetic biology is taken up in different countries as part of strategies to develop the bioeconomy via a transition to bio-based manufacturing. During the 34th meeting of the Working Party on Biotechnology, an analysis of the responses to the survey was presented. The main message from this analysis is that the use of synthetic biology for bio-based manufacturing is at a very early stage. Only a very limited number of countries have a roadmap in place supporting the use of
synthetic biology. On the other hand, several countries have policies in place to support the development of the bioeconomy, and the use of synthetic biology is often part of these policies. However, a number of different policies and strategies to address global challenges are emerging that may have overlapping goals, e.g. goals supporting the development of industrial biotechnology, green growth, urban cities, sustainable energy, etc. These developments are not disconnected, but questions arise concerning the need to align and integrate these different strategies and policies, and how this might best be done. Different models of how these policies might be aligned were presented to the WPB to stimulate debate, and the results of the survey and this discussion will be incorporated into a synthetic report at the end of the biennium.

A first draft of this report was presented at the 24th meeting of the TFIB and the 34th Session of the WPB during June 2014. The draft report highlighted the importance of 2014 in the early development of synthetic biology. It mapped synthetic biology policy requirements to a generic bioeconomy action plan, and looked at how policies aimed at integrating synthetic biology into a bioeconomy might be in conflict with other policy initiatives.

The Secretariat has attended various workshops in Europe that have been focused on synthetic biology, with a particular focus on responsible innovation. A member of the Secretariat is a member of the EU’s Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR) Panel. This has a mandate from DG SANCO, DG RTD, DG Enterprise and DG Environment to formulate Opinions on synthetic biology. The first Opinion 1 is essentially drafted. It focuses on an operational definition for synthetic biology. The remaining Opinions will focus on risk assessment methodology, safety aspects and research priorities.

Recent Publications:
- OECD (forthcoming), The Impact of Synthetic Biotechnology on the Bioeconomy: Policies and Practices

See also:

Web site: www.oecd.org/sti/biotechnology/synbio

Contact: Jim Philp, Jacqueline Allan, Kathleen D'Hondt (STI/STP)

MARINE BIOTECHNOLOGY

Since December 2010, the OECD Working Party on Biotechnology (WPB) has been engaged on work on marine biotechnology, recognising its potential to make an important contribution to meeting global challenges and contributing to the development of the bioeconomy. An OECD Global Forum on Biotechnology was held in Vancouver, Canada, in 2012 to discuss the opportunities and challenges associated with the development of marine biotechnology. The forum, entitled Marine Biotechnology - Enabling Solutions for Ocean Productivity and Sustainability, brought together policymakers, regulators, industry leaders, academics, and social and natural scientists from the 34 OECD countries and from non-member and developing countries to review the most recent research and debates around the field, and to discuss how the potential of marine biotechnology could be realised. Insights gained from expert speakers
and roundtable discussions over two days were combined with substantive background research by the OECD’s WPB to delineate the opportunities associated with marine biotechnology and those areas of the field requiring further attention.

A report based on that workshop and significant additional work was released in September 2013 and highlighted at the 2013 Biomarine Business Convention in Halifax, Canada. It considers the potential of marine biotechnology to contribute to economic and social prosperity by making use of recent advances in science and technology. It discusses scientific and technological tools at the centre of a renewed interest in marine biotechnology, contributing to a new bioeconomy sector in many countries, and offering potential new solutions to global challenges. The report examines how these advances are improving our understanding of marine life and facilitating access to, and study of, marine organisms and ecosystems, and it considers the largely untapped potential of these bioresources. This promise is considered alongside the challenges associated with the development of resources that exist within complex ecosystems, and which are fluidly distributed in a vast, largely shared, environment. The report makes the case for a new global framework for the sustainable development of marine biotechnology and identifies some areas that would benefit from greater attention as governments develop policies to support marine biotechnology. In addition to this prospective view, the report also identifies some early policy lessons from governmental attempts to benefit from marine bioresources.

The report also formulates a number of recommendations concerning the need for definitions of marine biotechnology and the indicators needed to facilitate measurement of the impact of policy actions aimed at supporting marine biotechnology. In addition, the report addresses the need for shared research infrastructures for marine biotechnology. These issues were discussed in a workshop organised at the OECD in November 2013. Based on the discussions at the workshop, a definition of marine biotechnology that relies on the OECD statistical definition of biotechnology is being developed. An overview of large international infrastructure initiatives that may be important for marine biotechnology is also being undertaken.

As part of the 34th meeting of the WPB, a thematic session on marine biotechnology was organised to illustrate how marine biotechnology can contribute to the different work areas that are under consideration for the 2015-2016 Programme of Work and Budget (PWB) of the future Working Party on Biotechnology, Nanotechnology and Converging Technologies (BNCT). This may include: the contribution of marine biotechnology to the development of future production scenarios; its contribution to the development of the bioeconomy; an indication of how marine biotechnology might help address global challenges such as food security and safety for a growing population, or provide dietary solutions for an ageing population; and work aimed at measuring the impact of marine biotechnology on society and economic development.

Recent Publication:


See also:


Web site: [www.oecd.org/sti/biotechnology](http://www.oecd.org/sti/biotechnology)

Contact: Jim Philp, Jacqueline Allan, Kathleen D’Hondt (STI/STP)
Biotechnology for the Environment

The Working Party on Biotechnology (WPB) has explored barriers to the use of environmental biotechnology and has formulated guidance on how these barriers might be overcome. A Workshop on “Biotechnology for Environment in Future: Science, Technology and Policy” was held on 14-18 September 2010 in Rimini, Italy. The workshop aimed at building consensus on the main issues that environmental biotechnology R&D faces and on the ways to tackle them. A report based on this workshop and subsequent work was published in 2013.

Policy Issues for Bioplastics

To date, bioplastics and bio-based plastics account for a small proportion of the overall plastics market, but they are experiencing high market growth rates. Bio-based polyethylene (PE) has entered the market, to be followed soon by bio-based polypropylene and polyvinylchloride. This indicates a significant shift into large-scale application, a shift that is occurring in step with a growing political realisation that a shift to bio-based products and plastics could help address environmental issues. During 2012, work by the WPB focused on identifying the barriers and policy issues for bioplastics and resulted in a policy report published in 2013.

Recent Publications:


See also:


Web site: www.oecd.org/sti/biotechnology

Contact: Jim Philp (STI/STP)
BIOTECHNOLOGY STATISTICS

The OECD Key Biotech Indicators (KBI) were updated in October 2013. The KBI now cover 30 countries. The latest indicators are available at: oe.cd/kbi.

And for the first time, we also have the OECD Key Nanotech Indicators (KNI). Data were collected for 17 countries. The indicators are available at: oe.cd/kni.

Some of the KBI and KNI were used in the 2013 edition of our flagship publication, the OECD Science, Technology and Industry Scoreboard. The 2013 Scoreboard is available at: www.oecd.org/sti/scoreboard. It was released in October.

A Data Brief comparing the Key Biotech and Key Nanotech Indicators is available at: http://www.oecd.org/sti/biotech/KNI_KBI_Nov_2013.pdf.

Contact: Brigitte van Beuzekom (STI/EAS)

BIOENERGY AND BIOFUELS AT TRADE AND AGRICULTURE DIRECTORATE

The OECD work on bioenergy focuses on a comprehensive compilation of data and information, the categorization of the variety of support policies and the quantitative analysis of bioenergy policy measures.

Six years ago, OECD published an economic assessment of biofuel support policies (OECD, 2008a). It concluded that government support of biofuel production in OECD countries was costly, with a limited impact on reducing greenhouse gases and improving energy security, however with a significant impact on world crop prices. The study highlighted that other forms of bioenergy, such as bioheat, biopower and biogas, could represent economically more viable and environmentally more efficient ways to reduce GHG. Another publication (OECD, 2008b) presented the technology and costs associated with the bioheat, biopower production as well as second generation biofuels.

Another study (OECD, 2010) focused on the development and the environmental performance of those alternative forms of energy. They are mostly generated with non-agricultural feedstocks and, to a lesser extent, agricultural residues and wastes. Main technologies to convert biomass to heat and/or electrical power include the direct combustion, the gasification and the anaerobic digestion producing biogas. Combined heat and power generation plants allow improving the energy efficiency with the use of the remaining heat after power generation for space heating or in industrial applications.
The OECD-FAO Agricultural Outlook annual report covers biofuel market and related policy developments. The 2014 Agricultural Outlook (projecting on the 2014-2023 period) will be available on 11 July 2014 at www.agri-outlook.org. It includes a discussion on the uncertainties related to the implementation of the US Biofuel mandates through the US Environmental Protection Agency within its regular chapter on biofuels.

TAD has created a detailed database of policies in the fertilizer and biofuel sectors of OECD countries and several Emerging Economies available at http://www.oecd.org/tad/agricultural-policies/support-policies-fertilisers-biofuels.htm. An analysis of these policies and their implications for agricultural markets and incomes is currently being reviewed by Member countries, with a publication scheduled for summer 2014.

TAD participates in the Agricultural Market Information System (AMIS) project (www.amis-outlook.org). One of TAD’s contributions to AMIS is to report on current biofuel policies in the monthly monitor. In addition, TAD is putting together a large policy database including biofuel policies. The part of the policy database that covers biofuel policies is based on the above-mentioned fertilizer and biofuel database, extended to include all AMIS countries.

In collaboration with the Brazilian foundation Fundacao Getulio Vargas (FGV Projetos), the USDA and the European Commission, TAD has started a comparative analysis of the three key biofuel supply chains cane-ethanol, corn-ethanol and rape-biodiesel. A draft report is expected to be discussed in fall 2014.

**Publications:**

- OECD (2008a), Biofuel Support Policies – An Economic Assessment [en français]: OCDE (2008a), Politiques de soutien des biocarburants : une évaluation économique
- OECD (2008b), Developments in Bioenergy Production Across the World: Electricity, Heat and Second Generation Biofuels
- OECD (2010), Bioheat, Biopower and Biogas: Developments and Implications for Agriculture

**Web site:** www.oecd.org/tad/bioenergy

**Contact:** Céline Giner (TAD/ATM), Ronald Steenblik (TAD/EP), Martin Von Lampe (TAD/PTA)

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**BIOENERGY AND BIOFUELS AT THE IEA RENEWABLE ENERGY DIVISION**

The activities of the International Energy Agency (IEA), Renewable Energy Division, focus on policy and market analysis, system integration issues, analysis of renewable energy technologies and research, development and demonstration issues and priorities, amongst others.

Recent work in the division related to bioenergy includes the kicking off of a How-2-Guide for Bioenergy in collaboration with the IEA’s Low-Carbon Technology Platform. The guide will be developed based on the IEA’s extensive experience in developing technology roadmaps, and aims at providing a policy manual with practical guidance on the development of a roadmap for bioenergy (heat, power and/or biofuel) at the national level for a given technology. The How-2-Guide will be developed in collaboration with interested partner organisations, through a series of regional workshops. It will be published Q1 2015.
The Renewable Energy Division is currently finalising the 2014 edition of its Medium-Term Renewable Energy Market Report that includes projections out to 2020 for the development of biomass electricity and biomass heat around the world. In addition, the report includes forecast of developments in the biofuels market that has also been published as part of the Medium-Term Oil Market Report 2014 (launched 17 June). The Medium-Term Renewable Energy Market Report will also provide an outlook on renewable power investments, and will be launched via webinar on August 28, 2014.

An IEA Featured Insights paper on renewable heat has just been published at the end of April. The paper addresses the status of biomass and other renewable energy sources for use as heat in industry and buildings, around the world. Based on the analysis of the existing policy framework and mechanisms for the support of renewable heat in different countries, the paper will provide policy recommendations for the development of renewable heat in different end-use sectors.

**Publications:**

**Web site:** [http://www.iea.org/topics/renewables/](http://www.iea.org/topics/renewables/)

**Contacts:** Anselm Eisentraut, Adam Brown (IEA/EMS/RED)

### AGRICULTURAL INNOVATION SYSTEMS

Innovation within the global food and agriculture system is needed to increase productivity growth and sustainable resource use. The OECD project on agricultural innovation in OECD countries and emerging economies analyses recent developments in agricultural innovation systems and provides a forum for exchange of experiences. A framework for analysing the role of the government in fostering innovation in the agri-food sector has been developed. Ongoing work aims to test the framework, and explore specific issues such as public-private partnerships, evaluation methods, and the diffusion of innovation at farm-level.

Work on agricultural innovation and productivity in the OECD Trade and Agriculture Directorate (TAD) first considered the role of innovation in increasing productivity (OECD, 2010; 2011). It also analysed developments in farm productivity and agricultural innovation systems and the impact of policies on innovation and productivity in agriculture (OECD, 2012b). A Conference on Agricultural Knowledge Systems (AKS) was organised in June 2011 to explore how to foster the development and adoption of innovation at national and global level, in order to meet global food security and climate change challenges (OECD, 2012a). Many countries and international organisations are aware that status quo is not an option and that creating an effective and responsive environment for innovation requires greater efforts. The potential role of biotechnologies in increasing productivity and facilitating adaptation to climate change was recognised by many participants. The Conference provided useful material for reports published in 2012 and 2013 (see below).

An OECD report on the role of the government in fostering innovation in the agri-food sector was published in 2013 (OECD, 2013). It develops a framework for analysing a wide range of policies that affect agricultural innovation, which is being applied to three pilot country reviews (Australia, Brazil and Canada) to test feasibility and provide further guidelines to how governments can improve the creation and adoption...
of innovation in agriculture and the agri-food sector. First draft pilot country reviews were discussed in May 2014 and revised versions will be presented in November with a view to declassification on the responsibility of the Secretary General. The framework is also being used to analysis agricultural innovation systems in Colombia and the Netherlands. Work during 2014 will also consider specific issues more in-depth: the development of public-private partnerships; methods and practices for the evaluation of innovation systems; and an analysis of the determinants of productivity growth at farm-level, including innovation and agricultural policies.

A future meeting of the Food Chain Analysis Network will be dedicated to Public-Private Partnerships for agricultural innovation. It is planned for 13-14 October 2014 and will be organised in co-operation with BIAC. On 11-12 December 2014, a workshop will be organised to exchange countries’ experience on the evaluation of innovation systems.

Publications:

- OECD (2011), Fostering Productivity and Competitiveness in Agriculture, OECD publishing

Web site: www.oecd.org/agriculture/policies/innovation

Contacts: Catherine Moreddu, Shingo Kimura (TAD/PTA)

AGRICULTURAL SEED AND FOREST REPRODUCTIVE MATERIAL CERTIFICATION SCHEMES

The following three criteria namely; distinctness, uniformity and stability are used for defining crop varieties and form the basis for agricultural seed development and trade. Identification and minimum purity criteria are important components of sustainability, especially in the case of hybridisation and genetic modifications. For forest reproductive material reliability depends on several factors including identification of origin (region or provenance), selection and breeding.

The OECD Seed Schemes, established in 1958, are a set of international standards for field inspection and certification of the most important agricultural and vegetable species. The Schemes aim to harmonise seed certification; thereby facilitating and promoting international seed trade.
The seven Seed Schemes establish rules and standards for varietal inspection and certification of OECD listed varieties. Fifty-eight countries across the world are currently a member of one or more of the OECD Seed Schemes.

The List of Varieties Eligible for OECD Certification covers 200 species – including all major crops – and more than 53,000 varieties. OECD statistics indicate that the total weight of OECD certified seed traded corresponded to 470 million kg in 2010. The electronic database of the list of varieties was launched in 2011 and provides an online search facility for OECD listed varieties.

Among the emerging issues in the OECD Seed Schemes are the role of biochemical and molecular techniques in describing and identifying varieties; guidelines for complex multiplications abroad; and electronic certification systems of seed. In order to assess the current and future needs of international certification, the Technical Working Group on Varietal Purity and Varietal Identity develops new definitions and procedures to be introduced into the Schemes and discusses emerging issues in world seed trade.

**The OECD Forest Seed and Plant Scheme** was introduced in June 2007. This Scheme encourages the production and use of forest reproductive material that have been collected, processed and marketed in a manner that ensures their trueness to name. It is currently implemented by 27 countries. The Scheme's rules were recently completed by the most advanced “Tested” category and new types of basic materials, such as clones, clonal mixture and parents of families. Moreover, the Scheme is now adapted to deal with multifunctional forest trees. Currently the Scheme is exploring the possibilities how to deal with challenges caused by climate change and the importance of the origin of forest reproductive material in afforestation reforestation and in forest tree plantations.

**Future events:**
Forest Seed and Plant Scheme, Annual Meeting of the National Designated Authorities: 23-25 Sept. 2014 (OECD Paris)

Agricultural Seed Schemes,
- Annual Meeting of National Designated Authorities: June 2015 (OECD, Paris) *date to be confirmed*

**Recent Publications:**
- List of Varieties Eligible for Seed Certification; July 2014 (*available in the electronic database*)
- OECD Seed Schemes: Rules and regulations; 2014 edition
  - [français]: Systèmes des semences de l’OCDE : Règles et directives ; édition 2014
  - [español]: Sistemas de semillas de la OCDE, edición 2014
- OECD Forest Seed and Plant Scheme “2013” (Rules and Regulations)
  - [fr.]: Système de l’OCDE pour les semences et plants forestiers “2013” (Règles et Directives)

**Web sites:**  [www.oecd.org/tad/seed](http://www.oecd.org/tad/seed) ;  [www.oecd.org/tad/forest](http://www.oecd.org/tad/forest)

**Contact:** Csaba Gaspar (TAD/COD)
CO-OPERATIVE RESEARCH PROGRAMME: BIOLOGICAL RESOURCE MANAGEMENT FOR SUSTAINABLE AGRICULTURAL SYSTEMS

The OECD Co-operative Research Programme (CRP), which gathers 25 OECD countries, is based on the observation that multi-disciplinary agri-food research is needed to address the gaps in knowledge, deepen understanding and enhance the scientific base of policy. The objectives of the CRP are the following: to provide a sound scientific knowledge base to agricultural policy-making; to contribute to an informed public debate on current and emerging agro-food issues and help resolve conflicting views; and to promote scientific understanding and standards between major regions of OECD.

Operational features of the Programme involve supporting and promoting international co-operation and networking in the field of basic and applied research. It awards fellowships to scientists from a CRP member country to conduct research projects in another CRP member country, and supports financially workshops to address agro-food issues that are high on the science/policy agenda of Members. The CRP strategy emphasises the need to engage a range of scientific disciplines including the natural sciences, social sciences and the humanities in an interactive dialogue. Three themes will be addressed by the Programme during its mandate period (2010-2014): 1) The Natural Resource Challenge; 2) Sustainability in practice; and 3) The Food Chain.

Conferences (Co-)Sponsored by the Programme in 2014:
The CRP is sponsoring seven conferences in 2014 out of 26 applications. Information on these events is posted on the CRP website as it becomes available: www.oecd.org/agriculture/crp


  "Essentially, all life depends upon the soil. There can be no life without soil and no soil without life; they have evolved together." (Charles E. Kellogg, quoted in USDA Yearbook of Agriculture, 1938). Given that healthy soil is vital for supplying food, fibre and energy to a growing global population under a changing climate, changes to soil in response to land use and farming systems can seriously compromise future capacity for primary production and the provision of other ecosystem services. This workshop presented the cutting edge scientific research on understanding what changes are happening to inform land managers and the general public about farming systems that can protect and improve the soil resource. It brought together scientists and policy makers to clarify the role of policy in soil security and the scientific capacity to provide technical understanding and guidance to policy, and stimulated international collaboration on national and international initiatives. Major contributors to the workshop were the Australian National Soil Health Advocate and leading members of the Intergovernmental Technical Panel on Soils.

- **Sustainable Management including the use of Traditional Knowledge in Satoyama and Other SEPLS (Social Ecological Production Landscapes), Ishikawa, Japan, 30 April to 3 May 2014** ([http://crp-oecd2014-en.blogspot.jp/](http://crp-oecd2014-en.blogspot.jp/))

  The conference discussed the potential synergies of traditional local knowledge and other form of scientific knowledge related to ecosystem services in socio-ecological production landscapes, including Satoyama, and other forms of cultural landscapes, or SEPLS. Examples from various zones such as tropical, temporal, arctic were presented. Traditional production systems from around the world were presented and their importance in maintaining biodiversity within the ecosystems, especially in the face of climate change and declining rural populations were highlighted. Conversely the importance of biodiversity to maintain ecosystem services was a common theme. It is expected that the outcomes of the conference will contribute directly to the processes in the Convention on Biological Diversity (CBD), the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), International Treaty on Plant Genetic Resources for Food (ITPGR) and GIAHS (Globally Important Agricultural Heritage Systems), as well as be influential in national policies in relevant countries.
Increased adoption of GMOs across horticulture has the potential to deliver a number of benefits to society, including:

- reduced chemical usage, with flow-on health and environmental benefits; improved drought resistance, reducing use of valuable water supplies and ensuring food security in times of drought; greater availability of high quality horticultural produce to consumers, conferring food security to vulnerable populations and delivering economic and health benefits to consumers; increased productivity, helping to secure the economic future for horticultural producers around the world; and biofortification, adding nutrients and vitamins to staple crops of people who are suffering from malnutrition in developing countries. This conference will examine the pros and cons of genetic technologies and provide information that will allow consumers, horticultural producers and policy makers to make informed decisions about use of GMOs in horticulture for the broader benefit of society. This conference links closely to the work of the Working Party on the Harmonisation Regulatory Oversight of Biotechnology, and their work on New Plant Breeding Techniques.

- **Removing Barriers to the Uptake of GM Animals as a Sustainable Solution to Food Security and Safety, Geelong, Australia, 9-10 October 2014**

Given the need to double the world’s food production using the same natural resources as we have today, and the growing incidences of zoonotic diseases impacting animal and human health because of climate change, habitat disturbance and increased global movement of animals and people, genetic modification of livestock offers a significant and sustainable increase in efficiency and safety of food production, but public concern and a lack of understanding of the technology has a negative impact. This conference will seek to identify what the roadblocks are and how scientific research can provide data and information that will assist policy development and aid regulators in ensuring that such technologies are safe and effective.


The main objective of this conference is to improve the knowledge and understanding of how interdisciplinary approaches can contribute by analysing the transition from risk assessment to comprehensive management of plant health diseases risks and identify the areas in which this contribution could be improved. It will focus on the interface of plant health policy, economics and interdisciplinary science, to help us understand the drivers for future policy-making and identify the potential for novel approaches based on innovation and public-private partnership.

- **Innovations in Organic Food Systems for Sustainable Production and Enhanced Ecosystem Services, Long Beach California, US, 1-2 November 2014**

This conference will assess the state of knowledge about how organic agriculture can best contribute to societal outcomes of food production, environmental quality, and community prosperity. It will bring together leading scientists from around the world, together with extension professionals to enable the formation and spread of new ideas and partnerships which may have many valuable impacts on society by enhancing the benefits provided by organic agriculture, both in research and in practice. These may include enhancements to food security, water quantity and quality preservation, preservation of biodiversity (wild and in fields), soil quality and carbon sequestration, adaptation and resilience to the impacts of climate change, human health benefits, and rural economic development.

- **Mitigation Strategies to Halt the Decline of Biodiversity in Agricultural Landscapes, and Contribute to Agricultural Productivity, Brisbane, Australia, 2-4 November 2014**

This conference has an objective of developing simple management guidelines to support biodiversity on farmland without compromising production will enable farmers and land managers to create more sustainable agro-ecosystems that will benefit themselves and the wider community. The costs and impacts of food production are of relevance to all of society. Whether it is the cost of food staples like bread and rice, or the risk of exposure to pesticides on fresh fruit and vegetables, or the aesthetic value of trees and hedgerows in the farm landscape, how we farm impacts people daily. No single workshop will address all the challenges associated with intensive food production; however this workshop aims to develop new ways to facilitate improvements to land management that will result in more sustainable and secure agro-ecosystems.

**CRP Fellowship Awards in 2014:**
The CRP received 69 applications for Fellowship Awards in 2014, of which the following were selected for funding:

- Application of biochemical tools to enhance mussel seed resources
- Linkage Model Development between Commodity Prospects and Food Market Projections
- Factors affecting the role of forest ecosystems in building resilient food systems
- Social-ecological resilience helps forest management face uncertainty arising from climate change
Sea Water Irrigation for The Cultivation of Halophytes as sustainable, underutilised crops (SWITCH)

Maintaining Water Quality Under Sustainable Intensiﬁcation of Plantation Forestry in New Zealand

A dual measurement-modelling approach for water-use optimization in apple orchards in New Zealand

Defining maximum pest limits for phytosanitary treatments used in international trade

The Potential for Aquaculture in ‘Management and Exploitation Areas for Benthic Resources’ (MEABRs) in Chile.

Biotechnology solutions to enhancing utilisation of soil phosphorus in agroecosystems

Exploring targeted N management to maximize crop production and assure soil organic matter persistence

Use of grass-endophyte symbioses to improve pasture and grass-based system sustainability

Review on biodiversity monitoring in agricultural landscapes

An innovative technological platform to assess the impact of agricultural practices on honey bee pollination services

Validation of a slope stability model to improve sustainable agricultural-forest policy outcomes for erosion-prone lands

Characterization of the causative agent of high virulence columnaris disease

Characterisation of the soluble and bound phenolics of winery waste products as potential ameliorants of ruminant methanogenesis

Assessment of housing conditions on the cognitive bias, welfare on farm and at slaughter, and meat quality in pigs

Public perceptions of new processed food products with improved nutritional and health characteristics

Comparative genomics of polyphagous and monophagous spider mite pests: genome approach to development of novel pest control methods

Does stimulating lipid metabolism during in vitro fertilization improve embryo cryo-tolerance?

Developing bacteriophage encapsulation technology for processed meat products

Host-adaptation and evolution of Staphylococcus aureus in goats

The control of flavonoids by ROS-mediated stresses; a study to improve crops resilience to stress

Development of lecithin-stabilized oxidation resistant ﬁsh oil emulsions for human consumption

Soft Kernel Durum Wheat: Sustainable Local and Global Food Security

Precision forecast of feed intake of cows by using a positioning system to reduce feed losses

Identiﬁcation of chemical contaminants using mass spectrometry without chromatography

Using early flowering genes to accelerate fruit tree breeding

Activation of innate immune response to improve Peste des petits ruminants (PPRV) vaccines

Summary reports submitted by the individual research fellows in 2014 are posted on the CRP website www.oecd.org/agriculture/crp as they become available.

Note: The call for applications for the submission of applications for 2015 research fellowship awards and conference sponsorship will run from March 2014 to 10 September 2014.

All relevant information and application forms will be available on the CRP website, through the link: www.oecd.org/agriculture/crp.

Recent Publications:


Swaffield S. and J. Primdahl (Guest Eds.) (2014), Landscape Research, Volume 39, Number 2: Special Issue “Pathways Towards Local Scale Policy Integration in Agricultural Landscapes”, Routledge, Taylor & Francis Group, Abingdon,

Kohsaka R. and I.D. Thompson (Eds.) (2014), Sustainable Management including the use of Traditional Knowledge in Satoyama and other SELPS – Proceedings of International Conference Kanazawa University, Japan

Web site: www.oecd.org/agriculture/crp

Contacts: Carl-Christian Schmidt, Janet Schofield (TAD/PROG)
COMING EVENTS FROM JULY 2014

16-19 Sept 2014 (tbc): Workshop on Biochemicals production and policies (industrial biotechnology) in Brazil (contact: J. Philp, STI/STP)


8-10 Oct. 2014: Industrial Biotechnology Workshop, in conjunction with the 3rd Stakeholders Bioeconomy Conference, Turin, Italy (contact: J. Philp, K. D'Hondt, STI/STP)

13-14 October 2014: OECD Food Chain Analysis Network meeting on Public-Private Partnerships for agricultural innovation, OECD, Paris (contact: C. Morredu, S. Kimura, TAD/PTA)

3 December 2014: Joint meeting of the Working Party on Biotechnology and the Working Party on Nanotechnology, OECD, Paris Italy (contact: S. Horsin, STI/STP)

4 December 2014 (am) 25th meeting of the Task Force on Biotechnology, OECD, Paris (contact: S. Horsin, STI/STP)


11-12 December 2014: Workshop on methods to evaluate agricultural innovation systems (contact: C. Moreddu, TAD/PTA)


29-30 January 2015: Third Green Growth Knowledge Platform Annual Conference: Fiscal instruments for a green economic transition, Milan, Italy (contact: N. Girouard, ENV/GG)


(date tbc) June 2015: Agricultural Seed Schemes, Annual Meeting of the National Designated Authorities, OECD Paris (contact: C. Gaspar, TAD/COD)
OECD’s web site includes much information on biotechnology and related topics. The web site allows individual users to tailor the OECD site to their needs. By selecting the themes that interest them, visitors can personalize their homepages at My OECD to present the news, events, and documentation related to their chosen themes. Links to more detailed web pages are given in related sections above.

Visitors can also choose to receive automatically future editions of Biotechnology Update through My OECD.

- OECD’s portal: www.oecd.org
- OECD’s work on biosafety and food/feed safety for transgenic products, see BioTrack Online: www.oecd.org/biotrack
- OECD’s work on biodiversity: www.oecd.org/env/biodiversity
- OECD’s biotechnology portal: www.oecd.org/sti/biotechnology
- OECD’s key biotechnology indicators (KBI): oe.cd/kbi
- OECD’s key nanotech indicators (KNI): oe.cd/kni
- OECD’s work on synthetic biology: www.oecd.org/sti/biotechnology/synbio
- OECD’s work on bioenergy: www.oecd.org/tad/bioenergy
- IEA’s work on renewable energy: http://www.iea.org/topics/renewables/
- OECD’s work on agricultural innovation systems: www.oecd.org/agriculture/policies/innovation
- OECD’s seed certification schemes (agriculture, forest): www.oecd.org/tad/seed; www.oecd.org/tad/forest
- OECD’s Cooperative Research Programme on Biological Resources in Agriculture: www.oecd.org/agriculture/crp
WHO’S WHO IN BIOTECH AT OECD?

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ENDNOTE: A BRIEF GUIDE TO THE OECD

The Organisation for Economic Co-operation and Development (OECD) is an intergovernmental organisation with 34 member countries. The mission of the OECD is to promote policies that will improve the economic and social well-being of people around the world. OECD brings together the governments of countries committed to democracy and the market economy to support economic growth, boost employment, raise living standards, maintain financial stability, assist other countries’ economic development, and contribute to growth in world trade.

The Organisation provides a setting where governments compare policy experiences, seek answers to common problems, and identify better policies for better lives. An increasing number of non-member economies participate in a wide range of activities, including some of those related to biotechnology.

The Council of OECD is the highest decision-making body of the Organisation. Its members are the Ambassadors of the Member countries to OECD. It is chaired by OECD’s Secretary-General. Once a year, it meets at the level of Ministers from member countries. The Council decides on the annual budget of Organisation as well as the content of the programme of work.

In addition to the Council, there are around 200 specialised Committees and other bodies (including Working Parties, Working Groups, and Task Forces), which undertake the Organisation’s programme of work. The governments of the Member countries nominate the participants to all these groups.

2 OECD member countries are: Australia, Austria, Belgium, Canada, Chile, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The European Commission also takes part in the work of the OECD.
The list below shows the main OECD bodies that have activities related to biotechnology:

**OECD COUNCIL**

Green Growth Strategy

Innovation Strategy

Global Forum on Biotechnology

Committee for Scientific and Technological Policy (CSTP)
- Working Party on Biotechnology *(until end of 2014)**
- Working Party on Nanotechnology *(until end of 2014)**
- **Working Party on Biotechnology, Nanotechnology and Converging Technologies (BNCT) *(from 2015)*
- Working Party of National Experts on Science and Technology Indicators
- Task Force on Industrial Biotechnology
- Task Force on Biomedicine and Health Innovation

Committee for Agriculture (COAG)
- Working Party on Agricultural Policies and Markets (APM)
- Co-operative Research Programme
- Research Programme on Bioenergy *(Trade and Agriculture Directorate, in collaboration with the International Energy Agency)*
- Seed Certification Schemes (agriculture, forest)

Joint Working Party on Agriculture and the Environment (JWPAE)

Environment Policy Committee (EPOC)
- Working Group on Biodiversity, Water and Ecosystems (WPBWE)
- Working Party on Climate, Investment and Development (WPCID)

Chemicals Committee and Working Party on Chemicals, Pesticides and Biotechnology (Joint Meeting)
- Working Group for the Harmonisation of Regulatory Oversight in Biotechnology (WG-HROB)
- Task Force for the Safety of Novel Foods and Feeds