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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).

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)
2015 Green Growth and Sustainable Development Forum: Enabling the Next Industrial Revolution: The role of systems thinking and innovation policy in promoting green growth.

The 2015 Green Growth and Sustainable Development Forum (GGSD Forum) will be held at the OECD on 14-15 December 2015. It will examine how to foster the “next industrial revolution” by harnessing the potential of systems innovation policies that support green growth.

Systems innovation is a horizontal policy approach that mobilises technology, market mechanisms, regulations and social innovations to solve complex societal problems in a set of interacting or interdependent components. They are characterised by disrupting or complementary types of knowledge and technical capabilities, fundamental changes in consumer practices and markets as well as novel types of infrastructures, institutional rules and skill sets.

This Forum’s three plenary sessions will focus on: capturing innovation complementarities; emerging technologies and firm dynamics; and the role of new sources of data (including “big data”). A series of parallel sessions are also being planned to address topics such as risk, international cooperation as well as measurement and evaluation. Bio-technology and nano-technology are relevant fields that are expected to be discussed across a number of different sessions.

Towards Green Growth? Tracking Progress

The 2011 Green Growth Strategy provided initial guidance to governments on how to achieve economic growth and development, while preventing costly environmental damage and inefficient resource use.

What progress have countries made in aligning economic and environmental priorities since 2011? Towards Green Growth? Tracking progress attempts to evaluate this progress and highlight where there is broad scope to heighten the ambition and effectiveness of green growth policy. It draws lessons from green growth mainstreaming across the OECD’s work programme, notably in terms of how governments can maximise institutional settings to seize economic opportunities surrounding the transition to a green economy, and considers ways to enrich the Green Growth Strategy based on work undertaken since its launch.

You may also find the Key Findings and Recommendations of the report in English, French and Spanish.
Energy is a critical input into the production and consumption patterns that support economic and social wellbeing. However, many forms of energy use contribute to the environmental and climate challenges societies face today. Taxation is a key tool by which governments can influence energy use to contain its environmental impacts. This report provides a systematic analysis of the structure and level of energy taxes in OECD and selected other countries; together, they cover 80% of global energy use.

This report builds on the 2013 edition of Taxing Energy Use, expanding the geographic coverage of the 2013 data set to include Argentina, Brazil, China, India, Indonesia, Russia and South Africa. The report describes energy use, taxation and pricing in these countries and presents detailed graphical profiles of the structure of energy use and taxation for each.

The analysis reveals large differences in the taxation of energy across countries, although common patterns emerge. Transport taxes are considerably higher than in other sectors, where fuels that cause considerable harm for the environment and human health are often taxed at very low – or zero – rates. With few exceptions, countries' energy taxes do not harness the full power of taxes to reduce pollution and combat climate change.

Aligning Policies for a Low-carbon Economy

This report produced in co-operation with the International Energy Agency (IEA), the International Transport Forum (ITF) and the Nuclear Energy Agency (NEA) identifies the misalignments between climate change objectives and policy and regulatory frameworks across a range of policy domains (investment, taxation, innovation and skills, trade, and adaptation) and activities at the heart of climate policy (electricity, urban mobility and rural land use).

Outside of countries’ core climate policies, many of the regulatory features of today’s economies have been built around the availability of fossil fuels and without any regard for the greenhouse gas emissions stemming from human activities. The Aligning Policies for a Low-carbon Economy report makes a diagnosis of these contradictions and points to means of solving them to support a more effective transition of all countries to a low-carbon economy.

Future events:


Web site: www.oecd.org/greengrowth
Contact: Kumi Kitamori, Ryan Parmenter (ENV/GGGR)
GREEN GROWTH AND AGRICULTURE

Background
Green growth was identified as one of the priorities by Agriculture Ministers at their meeting at OECD in 2010. The relationship between agriculture and green growth is complex and non-linear. The food and agricultural sectors cause both environmental harm and provides environmental benefits. This is because the sector both depends and impacts on natural resources (land, biodiversity, carbon, nitrogen and water) in the production process, there is a wide diversity of resource endowments and environmental absorptive capacities, and the impacts can differ in the short and long run and at different scales of production, thus the context is critical.

Green Growth at OECD Trade and Agriculture Directorate
Work on green growth and agriculture in the OECD Trade and Agriculture Directorate (TAD), which is undertaken under the Joint Working party Agriculture and Environment (JWPAE), first outlined a broad strategy for green growth in the food and agriculture sector as part of the OECD’s Green Growth Strategy (OECD, 2011). The key message from that report is that green growth is not only desirable and achievable, it is also essential if the food and nutrition requirements of future generations are to be met.

Subsequently, a report was published synthesising the experience of OECD countries in developing and implementing policies related to green growth in agriculture (OECD, 2013). More recently, several reports have been produced looking at relevant indicators for green growth in agriculture, including initial work on environmentally adjusted factor productivity, the role of knowledge investment and capacity building, various farm management practices aimed at improving agriculture resource efficiency and productivity.

The report “Green Growth Indicators for Agriculture - A preliminary Assessment”, recently published, presents the work undertaken to identify the relevant and measurable indicators for the agricultural sector in alignment with the OECD’s Green Growth Measurement Framework (OECD, 2014 – see also above section ‘Green Growth and Sustainable Development’).

These indicators have been calculated and applied to a selected number of OECD countries in three specific policy areas: the transition to a low-carbon, resource-efficient agricultural sector; the maintenance of a natural asset base; and the implementation of policies aimed at realising the economic opportunities associated with green growth in the agricultural sector. Work on agricultural total factor productivity and the environment, which is among the priority areas for follow-up work monitoring progress towards green growth in agriculture, is underway.

It is envisaged to hold a Workshop on Environmentally-Adjusted Total-Factor Productivity (TFP) in Agriculture and its Determinants across OECD Countries, as mandated under the 2015-16 Programme of Work and Budget of the Committee for Agriculture. This work is undertaken in collaboration with other OECD Directorates (ECO, STD and ENV), which are working to estimate this indicator for the economy as a whole.

Another group of work focuses on the impacts of various farm management practices on resource efficiency and productivity. Reports were prepared on farmer-led management systems, such as conservation agriculture, organic farming and integrated pest management, and new science and generic technologies with green potential, such as biotechnologies and precision agriculture. A full complete draft of this work was presented to the April 2015 meeting of the OECD Joint Working Party on Agriculture and the Environment.
Under the umbrella work on the analysis of policy options and market approaches for green growth for agriculture and food, several reports have been produced in the past year. One group of studies examines investment in knowledge, such as farm advisory services, training and extension initiatives to support agri-environmental policy implementation in OECD countries. Based on literature review and selected case studies, this work aims to i) discuss the role and range of knowledge investment measures; ii) assess their performance and impacts; and iii) draw lessons about best policy practices. The case studies are: Australian Primary Industries Research, Development and Extension System; Sustainable Farming Fund in New Zealand; Canadian Growing Forward Program; Training, Advice and Extension Services in England and Welsh; and Farm Advisory Services in Greece. This work was published in Spring 2015 (OECD, 2015).

Future event:

Recent Publications:

Contact: Dimitris Diakovas (TAD/EP)

GLOBAL FORUM ON BIOTECHNOLOGY

The Global Forum on Biotechnology, established in 2010, is one of 16 Global Fora created by OECD Committees. Global Fora 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 Fora provide platforms for peer learning and policy dialogue on issues which require interaction with Partners world-wide. Global Fora can also promote multidisciplinary and horizontal approaches beyond the scope of any single Committee and foster partnerships with other intergovernmental organisations.

OECD Global Fora 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.

1 The Global Forum on Transparency and Exchange of Information for Tax Purposes differs from all other Global Fora: it is a separate OECD programme in which many countries and economies outside the OECD’s Membership participate on an equal footing with OECD Member countries.
The principal functions of Global Fora 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.

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.

In the fourth quarter of 2015, the OECD External Relations Committee will make a qualitative assessment of the extent to which the Global Fora have met their objectives. The Secretariats and Bureaux of the parent committees of each Global Forum will be consulted.

**Web site:** General information on the Global Fora: [www.oecd.org/globalrelations/Fora](http://www.oecd.org/globalrelations/Fora) (English)  
[www.oecd.org/relationsmondiales/Fora](http://www.oecd.org/relationsmondiales/Fora) (Français)

**Contact:** Jan Schuijer (SGE/GRS)

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

In 2012, the Partnership for Biosafety Risk Assessment and Regulation (*the Partnership*) was formed by the OECD, the Development Grant Facility of the World Bank and the ILSI Research Foundation’s Center for Environmental Risk Assessment (CERA). The Partnership came to the end of its fixed three-year period at the end of 2014. The main objective was to assist developing countries better promote the harmonization of biosafety regulations in their countries when considering the adoption of agricultural biotechnology. Although risk assessment and management need to be an integral part of a biosafety framework, the partners saw the need for reaching a wider range of stakeholders across sectors within countries to integrate environmental risk/safety assessment and to create the enabling environment for informed decision-making on the regulation and adoption of novel technologies.

One important element for achieving this goal was to involve these countries in the activities of the OECD Working Group on Harmonisation of Regulatory Oversight in Biotechnology. The Working Group has had 20 years of relevant experience in environmental risk assessment of transgenic organisms that can be shared. In parallel, the OECD Task Force for the Safety of Novel Foods and Feeds offered 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 70 consensus documents that describe characteristics relevant for the risk assessment of plants, animals, microorganisms and traits. These documents, as well as the OECD database on biotech product approvals, are publicly available for the use of all interested biosafety authorities and experts. The cultivation of transgenic crops, and the trade and use of biotech products is certainly expanding beyond the OECD Members and the participation of non-OECD countries 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, cowpea, eucalyptus).
With PBRAR financial support, OECD’s Biosafety Team facilitated the participation of new partner countries in meetings of the Working Group and Task Force for the Safety of Novel Foods and Feeds. This was critical to OECD’s strategy to involve non-member countries on a regular basis to promote harmonization in methods for assessing environmental and health impacts. The Partnership program has allowed countries from Asia, Africa, South America and Eastern Europe to contribute to OECD biosafety work. These new participants, such as from Bangladesh and Paraguay, have noted their strong desire to continue their involvement in the future and are likely to find the means to do so. Other meetings associated with the Partnership in 2014 included several CERA events such as: a workshop offering hands on experience in the testing for impacts to non-target organisms; a workshop in Paraguay on inspection and monitoring of confined field trials (July 2014); and the South Asia Biosafety Conference held in Sri Lanka in September 2014. Partner country participants from Kenya, Colombia and Bangladesh attended the 2014 meetings of the OECD Working Group and the Task Force.

Although the Partnership has come to the end of its fixed three-year term, one of the main aims at the outset was to establish permanent global networks so the exchange of expertise on biosafety will continue into the future. As a result, those new partners who attended meetings of OECD’s Working Group and Task Force as part of the Partnership will be invited to attend future meetings and to participate in associated OECD projects.

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 safety of transgenic organisms (plants, animals, micro-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 the Business and Industry Advisory Committee to OECD (BIAC). Key partner economies (Brazil, China, India, Indonesia, South Africa), other interested countries (such as Bangladesh, Kenya, Paraguay, 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, 48 Consensus Documents have
been published. They address a range of subjects including the biology of crops (recently on cassava), the biology of trees (recently on eucalyptus species, a fast growing tree used for plantations in tropical and sub-tropical areas), the biology 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).

The proceedings of the OECD Conference on the Environmental Uses of Micro-organisms, were published in January 2015. They covers the state-of-the-art of environmental microbiology, addressing various themes including the use of micro-organisms in agriculture or for production purpose.

Other work under development by the WG-HROB are as follows:

- **Crop species:** the biology of sorghum, tomato, and cowpea;
- **Animals:** the biology of 1) Atlantic salmon, and 2) Mosquito Aedes aegypti where engineered strains are being used in Brazil to fight against dengue fever spread;
- **Micro-organisms:** the use of phototrophic micro-algae for production purposes (starting with eukaryotic micro-algae), which is an important emerging trend; and
- **Key issues in the context of environmental risk assessment:** 1) Considerations for the release of transgenic plants, and 2) New Plant Breeding Techniques.

**Future events:**

- 4th meeting of the Steering Group on Environmental Considerations, Washington D.C., United States, 23-25 September 2015

**Recent publications:**


**Upcoming publications:**

- Consensus Documents on the Biology of: – Sorghum – Tomato
- New Plant Breeding Techniques: Report on the OECD Workshop held in February 2014

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

**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 “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.

A project has started on the composition of apple (*Malus domestica*) under the leadership of Germany. Work continues on common bean (*Phaseolus vulgaris*, lead country Brazil), and on updating the current document on rice (*Oryza sativa*, project led by Japan) for which collaboration with the International Rice Research Institute was developed during an OECD Expert Workshop held at IRRI Philippines in October 2014. Other activities are being contemplated, including composition of other plant species such as cucurbits, and also animal compositional data, novel feed ingredients (Canada/Netherlands lead countries) for which a partnership with FAO is contemplated, information sharing on new plant breeding techniques initiated by the Netherlands, and the feasibility for Joint Reviews of novel foods and feeds assessment that was discussed at the next Task Force plenary meeting in April 2015.

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 2015.

**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, sugarcane or sorghum, while Brazil is leading the project on common bean.

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

**Future events:**

Recent publications:

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*)

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

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

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**BIOTRACK ONLINE**

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.

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, Canada, Japan, Mexico, Paraguay and the E.U on new or updated entries was added to the Product Database during 2014 and the first half of 2015, and information from Brazil will follow soon. The database includes now about 240 products of transgenic crops and flowers from 14 plant species.

In addition, a unique identifier checker was added to the database welcome page in March 2015, by which the last single digit called “verification digit” is calculated or validated.

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

Progress continued on co-operation between the OECD’s Product Database, the CBD Biosafety Clearing-House and the 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. The second webinar on "the International Databases on Biosafety," jointly organised by FAO, UNEP-CBD and OECD, was held in May 2015 in order to provide an overview of the respective databases, facilitate the information exchange between the systems, and improve
coordination with national authorities. In total, the two webinars were attended by more than 150 regulators, risk assessors and experts from 76 countries.

Web site: BioTrack Online www.oecd.org/biotrack  
Products Database www.oecd.org/biotrack/productdatabase  
Contacts: Takahiko Nikaido, Bertrand Dagallier, Peter Kearns (ENV/EHS)

Biodiversity - BioTrack

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). The work is conducted under the oversight of 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 (biodiversity chapter), 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 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 this could be scaled up. It then examines the key design and implementation features that need to be considered for each mechanism 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.

Forthcoming shortly is an OECD (2015) publication on Biodiversity Offsets: Effective Design and Implementation. Drawing on the literature on biodiversity offsets (including biobanking) and on case studies across developed and developing countries, the work analyses the role of biodiversity offsets in delivering the conservation and sustainable use of biodiversity in economic development projects. It examines the contribution of environmental and social safeguards, including the mitigation hierarchy, and highlights 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 and lessons learned, was convened in Paris on 6-7 November 2013.

Other recent work includes an OECD Environment Working Paper (2014) on The Role of National Ecosystem Assessments in Influencing Policy Making. The paper examines experience from the development of national and other ecosystem assessments (including from the UK, Japan, Spain and Portugal) to provide insights on how their impact on policy can best be enhanced. Another OECD Environment Working Paper (2015) focuses on Biodiversity Policy Response Indicators. More specifically, this examines the types of policy response indicators that may be suitable for monitoring progress towards the CBD’s 2011-2020 Aichi Biodiversity Target 3 (on incentives) and Target 20 (on resource mobilisation).

Other work currently underway is on (i) the economics of marine protected areas, (ii) biodiversity and development, and (iii) barriers to effective biodiversity policy reform.
**Future event:**

**Recent publication:**

**Upcoming publications and working papers:**
- 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)

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**WORKING PARTY ON BIOTECHNOLOGY, NANOTECHNOLOGY AND CONVERGING TECHNOLOGIES (BNCT)**

The BNCT held its inaugural meeting on 18-19 May 2015, reminding delegates of the genesis and main goals of the BNCT, based on the mandate of the group and on CSTP discussions and decisions. The BNCT is focused on policy issues in emerging technology fields related to bio, nano and converging technologies. It aims to contribute original policy analysis and messages to the global community, and to make ground-breaking proposals to policy makers. The 1st BNCT Meeting emphasised the nature of convergence between classical scientific disciplines and agreed to reflect this in a number of case studies on ‘Cross-Cutting Topics’; the BNCT’s work programme for the next two years will focus on the following project areas:

- Indicators and Impact Assessment in Nano and Bio
- Emerging technologies for Health
- Innovation for a Sustainable Bioeconomy
- Case studies and Cross Cutting Topics

**Future event:**

**Contacts:** David Winickoff, Steffi Friedrichs (STI/STP)

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**BIOMEDICAL RESEARCH AND HEALTH INNOVATION**

How to accelerate more radical technical change and how to implement new scientific and therapeutic paradigms into existing policy and regulatory frameworks are important questions in Biomedical Research and Health Innovation (BNCT). New and emerging technologies offer great potential to foster innovation in biomedical research, medical diagnostics and therapy. With the technical and scientific evolution occurring
across previously well-defined frontiers there is a need to review the adequacy of existing policy frameworks in biomedical research.

Work on ‘Emerging Biomedical Technologies for Health’ aims to provide evidence for policy advice to support the responsible development and use of converging biomedical technologies for health innovation. This can help devise the appropriate mechanisms to synergistically increase the efficiency of policy development and the impact, speed, and depth of technological innovation. Converging technology case studies in the area of advanced therapeutics, diagnostics, and pharmaceutical production, as well as expert meetings and workshops (i.e. Lausanne II) aim to provide evidence on the impact of policy, economic, and societal factors along the trajectory of research and innovation. Conclusions will be drawn on: 1) how to foster the responsible development and use of converging technologies; 2) how to manage converging technologies more generally to harness benefits and to increase the efficiency of policy making; and 3) how to optimise collaborative research and health innovation. Work could include: technology case studies, questionnaire, and expert meetings. Broader policy questions to be addressed are for example:

- How is innovation in converging technologies different from previous waves of technological change?
- Which factors favour disruptive technology emergence over application-focused, incremental technology evolution?
- Is technical innovation today decoupled from social and institutional mechanisms? Is there a need to reform (regulatory) policy?
- What are the options for a stronger link between regulatory science and emerging technologies to leverage uncertainty and enable evidence based decision making?

Recent Publications:


Contact: Hermann Garden (STI/STP)

INDUSTRIAL BIOTECHNOLOGY

Studies relating to industrial biotechnology

Several studies developed by the OECD DSTI, Science and Technology Policy Division were published by OECD in 2010 and 2011: i) Industrial Biotechnology and Climate change; ii) Future Prospects for Industrial Biotechnology; and iii) Towards the Development of OECD Best Practices for Assessing the Sustainability of Bio-based Products.

Other articles were published in 2012 and 2013 in scientific journals: ‘Trends in Biotechnology’: Biomass sustainability and certification, Bioremediation, an environmental remediation technology for the
Council Recommendation on Assessing the Sustainability of Bio-based Products

The draft Council Recommendation was prepared by the Task Force on Industrial Biotechnology. Following public consultation on the draft Recommendation in 2012, distributed 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 in July 2012 and was approved by Council 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

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 fulfil 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.

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: Policies for Bioplastics in the Context of a Bioeconomy.

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:**

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

This Forum was held on 25-27 November 2013 in Mexico City. It was organised by the Human Genome Organisation (HUGO), the Global Biotech Consulting Group, Genómica y Bioeconomia and CONACYT, in co-operation with the OECD. The Forum 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:


See also: Philp, J.C., R.J. Ritchie and J.E.M. Allan (2013), Synthetic biology, the bioeconomy and a societal quandary, Trends in Biotechnology 31, pp. 269-272.

Upcoming publication:

OECD, The Impact of Synthetic Biotechnology on the Bioeconomy: Policies and Practices

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

Contact: Jim Philp, Kathleen D'Hondt (STI/STP)
BIOTECHNOLOGY STATISTICS

The OECD Key Biotech Indicators (KBI) and the OECD Key Nanotech Indicators (KNI) will be updated in July 2015.

The KBI cover 28 countries and the latest indicators will be made available at: oe.cd/kbi. The KNI data cover 21 countries and the indicators will be available at: oe.cd/kni.

Contact: Brigitte van Beuzekom (STI/EAS)

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 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.

Publications:

Web site: www.oecd.org/sti/biotechnology
Contact: Jim Philp, Dominique Guellec, Kathleen D’Hondt (STI/STP)

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**ENVIRONMENTAL BIOTECHNOLOGY**

**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)

## BIOENERGY AND BIOFUELS AT TRADE AND AGRICULTURE DIRECTORATE

The subject of bioenergy touches various areas, in particular, scientific developments, environmental effects, energy balances and agricultural market economics. In that context, the OECD has launched an overarching research program. Led by the Trade and Agriculture Directorate (TAD), it incorporates expertise from other directorates of the OECD as well as the International Energy Agency. 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.

In 2008, OECD published an economic assessment of biofuel support policies. 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, 2008) presented the technology and costs associated with the bioheat, biopower production as well as second generation biofuels.

Another OECD study published in 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 2015 Agricultural Outlook (projecting on the 2015-2024 period) is available at www.agri_outlook.org, with Brazil as special theme. A specific discussion of the ethanol market in Brazil is included in the report.

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 has just been published within the Food, Agriculture and Fisheries Paper series (von Lampe et al., 2014; French version available soon).

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 spring 2015.

Publications:


Fertiliser and biofuels support policies database: [http://www.oecd.org/tad/agricultural-policies/support-policies-fertilisers-biofuels.htm](http://www.oecd.org/tad/agricultural-policies/support-policies-fertilisers-biofuels.htm)

Contact: Annelies Deuss (TAD/ATM), Céline Giner (TAD/ATM), Ronald Steenblik (TAD/NRP), 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.

The Renewable Energy Division is currently working on the 2015 edition of its Medium-Term Renewable Energy Market Report. This will include medium term projections out to 2020 for capacity and generation from biomass electricity and biofuels production, including extended content on second generation biofuels. The Medium-Term Renewable Energy Market Report will be launched in early Q4 2015.

Ongoing work in the division also includes the development of a How-2-Guide for Bioenergy in collaboration with the IEA’s Low-Carbon Technology Platform. The guide is based on the IEA’s extensive experience in developing technology roadmaps, and aims to provide 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 has been developed in collaboration with interested partner organisations and through regional workshops held in Latin America, Southeast Asia and Southern Africa. It will be published later in 2015.

Forthcoming activities also include collaboration with stakeholders to enhance and collect bioenergy technology and fuel cost assumptions to inform future analysis and publications.

Recent publications:


Upcoming documents:

AGRICULTURAL INNOVATION SYSTEMS

Innovation within the global food and agriculture system is needed to increase productivity growth and sustainability. OECD work in this area analyses developments in agricultural innovation systems and the role of the government in fostering innovation in food and agriculture. A framework for analysing how a wide range policies affect agricultural productivity growth and sustainability, through their impact on innovation, structural change, resource use and climate change, has been developed and used to provide country-specific advice. On-going work aims to further improve the framework, apply it to additional country reviews, and analyse linkages between policies, innovation, structural change and sustainable productivity growth to strengthen evidence-based policy advice. It also continues to provide a forum for exchange of experiences on how to improve the development and dissemination of innovation to better respond to global challenges.

Work on agricultural innovation and productivity in the OECD Trade and Agriculture Directorate (TAD) first considered the role of innovation in increasing productivity, see OECD publications "The Benefits from Agricultural Research and Development, Innovation, and Productivity Growth" (2010) and Fostering Productivity and Competitiveness in Agriculture (2011). It also analysed developments in farm productivity and agricultural innovation systems and the impact of policies on innovation and productivity in agriculture (Agricultural Policy Monitoring and Evaluation 2012: OECD Countries, 2012). A Conference on Agricultural Knowledge Systems (AKS) held in June 2011 explored 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: Improving Agricultural Knowledge and Innovation Systems: OECD Conference Proceedings, (2012). 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 subsequently (see below). OECD contributed to the Interagency Report to the Mexican G20 Presidency, together with contributions by Bioversity, CGIAR Consortium, FAO, IFAD, IFPRI, IICA, and UNCTAD (IO (2012), Sustainable Agricultural Productivity Growth and Bridging the Gap for Small-family Farms).

An OECD report on the role of the government in fostering innovation in the agri-food sector (Agricultural Innovation Systems: A Framework of Analysing the Role of Government, 2013) included the development of a framework for analysing a wide range of policies that affect agricultural innovation. This framework has been 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. The pilot reviews will be published by September 2015 (OECD, 2015a,b,c). The review of agricultural policies in Colombia, published in 2015, includes an analysis of the agricultural Innovation System and recommendations to improve its performance (OECD, 2015a). In 2015, the framework has been revised and extended to include the impact of policies on other drivers of productivity growth and sustainability, such as structural change, sustainable resource use and climate change. The revised framework has been used in a review of Dutch policies, which will be released in September 2015 (OECD, 2015d). Reviews of China, Turkey and the United States have been launched
in May-July 2015 and draft reports are expected to be discussed in spring 2016. Additional country reviews are foreseen in the context of work on food security in ASEAN, following an overview report on agricultural innovation system in ASEAN member countries.

The summary record of the Food Chain Analysis Network on public-private partnerships (PPP) for agricultural innovation, organised with the Business and Industry Advisory Committee to the OECD (BIAC) on 13-14 October 2014, is available on-line. A report on best practice to ensure successful PPPs for agricultural innovation will be discussed in November 2015. An analysis of the dynamics and determinants of productivity growth in dairy farms, including innovation and agricultural policies, will be published in the coming months (Kimura and Sauer, 2015). Further work on drivers of farm-level productivity is foreseen in the programme of work and budget of the Committee for Agriculture for 2015-16. A workshop will be organised in late 2015 or early 2016 to identify how scientific, technological and farm practice innovation can best respond to global interest in improving agriculture productivity, sustainability and food security, including through international collaboration in the development, dissemination and application of appropriate science, technologies and techniques.

**Publications:**

**Upcoming documents:**

**Future event:**
- Workshop *Innovation through Collaboration*, early 2016 (tbc)

**Web site:**  [www.oecd.org/agriculture/policies/innovation](http://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 seeds from OECD listed varieties. Fifty-eight countries across the world are currently a member of one or more of the Schemes. The request of the Republic of Senegal for joining the Schemes was approved at the 2015 Annual Meeting and the country will become a full member from January 2016.

The List of Varieties Eligible for OECD Certification covers 200 species – including all major crops – and more than 59 000 varieties. OECD statistics indicate that the total weight of OECD certified seed traded corresponded to 483 million kg in 2013. The electronic database provides an online search facility for OECD listed varieties and is available from the official website (see below).

Among the emerging issues in the OECD Seed Schemes are the role of biochemical and molecular techniques in describing and identifying varieties. In this framework, a joint OECD-UPOV-ISTA-AOSA Workshop on Biochemical and Molecular Techniques will take place in June 2016, back-to-back with the 2016 Annual Meeting of the OECD Seed Schemes.

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 on 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:

**Agricultural Seed Schemes,**
- Technical Working Group Meeting on Varietal Identity and Purity: 26-29 January 2016 (Cape Town, South Africa)
- Annual Meeting of National Designated Authorities: 7-10 June 2016 (OECD Paris)
- Joint OECD-UPOV-ISTA-AOSA Workshop on Biochemical and Molecular Techniques: June 2016 (tbc) (OECD Paris)

**Forest Seed and Plant Scheme,** Annual Meeting of the National Designated Authorities: 6-7 October 2015 (OECD Paris)

### Recent publications:
- List of Varieties Eligible for Seed Certification; January 2015
- OECD Forest Seed and Plant Scheme “2014” (Rules and Regulations) [fr.]: Système de l’OCDE pour les semences et plants forestiers “2014” (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 24 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 (2010-2015): 1) The Natural Resource Challenge; 2) Sustainability in practice; and 3) The Food Chain.

The call for applications for funding of international conferences and fellowships (individual research projects) in 2016 is open until 10 September 2015.

Conferences (Co-)Sponsored by the Programme in 2015:
The CRP is sponsoring nine conferences in 2015 out of 25 applications. Information on these events is posted on the CRP website as it becomes available: www.oecd.org/agriculture/crp.

- Feeding more than 9 Billion: Challenges and Choices by 2050, Canberra, Australia and Copenhagen, Denmark, 22 April 2015 (https://crawford.anu.edu.au/events/5477/feeding-more-nine-billion-2050-challenges-and-opportunities)

- Global Soil Security Symposium, College Station, Texas, USA, 19-21 May 2015 (www.soils.org/meetings/global-soil-security)

The aim of this conference was to provide a comprehensive and interdisciplinary view of the challenges with sustainable use of natural resources and the choices that must be faced in terms of production, trade and distribution of food. It explored a diverse range of issues, ranging from economic policy settings, institutional governance to more technical aspects relating to the need for better conservation of soils and the opportunities provided by new advanced technologies such as remote sensing and genomic breeding. One key policy message stressed in the conference was the need for more and better focused research and development. The need for productivity improvements and lessened impacts on the environment suggest that governments need to maintain or increase their investments in research and development in agricultural systems.

- Global Soil Security Symposium, College Station, Texas, USA, 19-21 May 2015 (www.soils.org/meetings/global-soil-security)

Scientists, policy influencers, investors, and citizens met at this symposium to discuss the need for a new focus on soil security. They identified five dimensions to soil security and identified goals to be achieved for each dimension to work towards achieving soil security in the next two decades. The dimensions and goals identified were: i) capability, or potential functionality – the goal is that 50% of soil is used according to its capability by 2030; ii) condition – the goal is that soil condition should be optimally managed according to the inherent capability in 50% of managed soil systems by 2030; iii) capital – the goals are to increase annual capital value of soil ecosystem services by 5% per annum by 2030 and that commercial land values are based on full economic value of soil capacity and condition by 2020; iv) connectivity – the goal is that there should 90% awareness and understanding of soil security amongst the general public by 2030; v) codification – the goal is to have 50% of national governments recognise soil security in their laws by 2025. There will be a further Global Soil Security Symposium in 2016 where the organisers are hoping to develop a quantitative framework for assessing each of the dimensions. (Thank you to the organisers for providing these goals.)
Agricultural Higher Education in the 21st century: A global challenge in knowledge transfer to meet world demands for food security and sustainability, Zaragoza, Spain, 15-17 June 2015 (www.iamz.ciheam.org/educagri2015/)

Today, in most northern, developed countries, with an ageing farmer population, less and less young people are interested in agricultural studies. This is an alarming policy challenge in OECD countries, where agricultural knowledge is advancing significantly, but the transfer of that knowledge via the higher education system lags behind. The main messages coming out of the conference were: there is a need to explain that agricultural education is now a lot broader and multidisciplinary than traditional farming, with links between agriculture, food and health (nutrition), or the environment; it involves communication and problem solving, leadership skills, project management, innovation production and management; issues of advanced technology such as using satellites and robots for precision agriculture, and biotechnology (e.g. improving crops for food and feed demand; understanding crop physiology to improve use of nutrients( root architecture); interaction between plants and microbiomes, as used in medicine (adding bacteria in the soil improves productivity); improving crop resistance to drought, salinity by modifying plants innate immunity, agrobiologicals, biostimulants) have the potential to attract students, but effort needs to be made by the scientists and academics in universities and research institutes to develop the perception of science and use a common language to improve society’s acceptance of the science.


The key objectives of the Consortium are to promote and stimulate improvement in the quality and relevance of international bio-economy research and policy analysis; and to encourage collaborative research among members of the Consortium. The pre-conference sponsored by CRP achieved important clarifications in the definition of the term bioeconomy, summarised the available micro- and macroeconomic models to measure its impact, emphasised that the traditional GDP-based assessment of bioeconomy is improper or even harmful, and bioeconomy should be measured by consumer surplus, discussed several issues showing the relationship or possible contributions of bioeconomy to sustainable agriculture; and described potential consequences to and requested actions in regulatory policies, envisioning future concerted OECD involvement in international bioeconomy data acquisition and assessment of bioeconomy.

Information about the other conferences which the CRP is sponsoring in 2015 will be given in the next Newsletter. They are:

Saskatoon International Workshop on Validation and Regulatory Analysis, Calgary, Alberta, Canada, 16-19 June 2015 (http://www.saskval.ca/)


Microsporidia in the Animal to Human Food Chain: An International Symposium to Address Chronic Epizootic Disease, Vancouver, Canada, 9 August 2015 (http://www.sipmeeting2015.org/oecd-symposium/)

Linking Ecosystem Services to Livelihood of Local Communities, Seoul, Korea, 13-15 October 2015 (no website available to date)

Sustainability of Rural Areas in Practice, Nitra, Slovak Republic, 3-4 December 2015 (http://www.surap.eu/index.php)
CRP Fellowship Awards in 2015:
The CRP is funding 26 fellowships in 2015. Examples of the topics that some of them deal with are given below.

- Addressing the global challenge of antibiotic resistance: characterizing antibiotic resistance elements associated with agricultural ecosystems
- Can cocoa agroforestry contribute to biodiversity conservation?
- Establishing quantitative AOP (adverse outcome pathway) links for extrapolation from in vitro to in vivo hazard assessment of pesticides
- Identification of enzyme genes required for biosynthesis of aluminium-detoxifying tannins in a Eucalyptus tree
- Genetic dissection of tolerance to suboptimal temperatures during early development in maize
- Population genomics of virulence and fungicide resistance in the wheat pathogen Zymoseptoria tritici
- Comparative genomics of downy mildew pathogens

Summary reports submitted by the individual research fellows in 2015 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 2016 research fellowship awards and conference sponsorship is open until 10 September 2015.

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

Recent publications:


Web site: www.oecd.org/agriculture/crp
Contacts: Franck Jésus, Janet Schofield (TAD/PROG)
COMING EVENTS FROM JULY 2015

27 July 2015

27-29 July 2015
International Symposium on Animal Functional Genomics, Placenza, Italy (contact: Prof. P. Ajmoney Marsan, UNICATT, Italy; J. Schofield, TAD/PROG)

9 August 2015
Microsporidia in the Animal to Human Food Chain: An International Symposium to Address Chronic Epizootic Disease, Vancouver, Canada (contact: Dr. L. Solter, University of Illinois; J. Schofield, TAD/PROG)

6-7 October 2015:
Forest Seed and Plant Scheme, Annual Meeting of the National Designated Authorities, OECD Paris (contact: C. Gaspar, TAD/COD)

20-21 October 2015
OECD Ministerial Meeting “Creating our Common Future through Science, Technology and Innovation”, Daejeon, Korea (contact: Committee for Scientific and Technological Policy CSTP)


9-10 November 2015
40th Session of the Joint Working Party on Agriculture and the Environment (contact: D. Diakosawas, TAD/EP)

30 November 2015

2-4 December 2015
2nd Meeting of the Working Party on Biotechnology, Nanotechnology and Converging Technologies (contact: D. Winickoff, STI/STP)

14-15 December 2015
Green Growth and Sustainable Development Forum: Enabling the Next Industrial Revolution: The role of systems thinking and innovation policy in promoting green growth. (contact: K. Kitamori and R. Parmenter, ENV/GGGR)

15-16 December 2015
Lausanne II Workshop on “De-risk Innovation for Central Nervous System Disorders: The Way Forward”, Lausanne, Switzerland (contact: H. Garden, STI/STP)

IN 2016

Early 2016 (tbc)
Workshop on “Innovation through Collaboration” (contact: C. Moreddu, TAD/PTA)

26-29 January 2016:
Agricultural Seed Schemes, Technical Working Group Meeting on Varietal Identity and Purity, Cape Town, South Africa (contact: C. Gaspar, TAD/COD)

13-15 April 2016:
30th Meeting of the Working Group on the Harmonisation of Regulatory Oversight in Biotechnology, OECD Paris (contact: T. Nikaido, ENV/EHS)

20 April 2016:
OECD Workshop on ‘Next-Generation Sequencing’, OECD Paris (contact: B. Dagallier, ENV/EHS)

7-10 June 2016: Agricultural Seed Schemes, Annual Meeting of the National Designated Authorities, OECD Paris (contact: C. Gaspar, TAD/COD)

7-10 June 2016 (tbc) Agricultural Seed Schemes, Joint OECD-UPOV-ISTA-AOSA Workshop on Biochemical and Molecular Techniques (OECD Paris)
OECD BIOTECHNOLOGY AND THE WORLD WIDE WEB

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 green growth: www.oecd.org/greengrowth (English) www.oecd.org/croissanceverte (Français)
- 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.

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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, Nanotechnology and Converging Technologies (BNCT)
  - 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
Internal Co-ordination Group for Biotechnology