

JRC newsletter



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Tackling major challenges through strong dialogue between science and society



Reinhard F. Hüttel,
Chairman of Euro-
CASE, President of the
National Academy of
Science and Engineering
in Germany (acatech)

It is impossible to imagine any area of our modern lives without engineering and technology. Today, modern technologies perform multiple functions. On the one hand, technologies address all of the grand challenges facing Europe today, whether it is healthcare, demographic change, transport and mobility, climate change or a reliable, affordable and sustainable energy supply. On the other hand, it is also evident that we will need better technology and more innovation going forward, if we are to compete with our global competitors in economic terms and maintain and advance our standard of living. As the European umbrella organisation of Academies of Applied Sciences, Technologies and Engineering, Euro-CASE, can make valuable contributions in proving scientific and technology-based evidence for political decision making processes.

Euro-CASE aims to provide impartial, independent and scientifically balanced policy advice on technology-related issues with a clear European dimension. As a network of Academies from 21

European states, we represent more than 6000 high-level experts from academia, engineering and business. Euro-CASE provides a unique platform for participation in debates on how to address the grand challenges facing our citizens. Scientific evidence is required at all stages along the policy making process and we can provide such evidence to political decision makers in order

“Scientific evidence is required at all stages along the policy making process.”

to increase European competitiveness and assure economic welfare.

Euro-CASE and the JRC decided to sign a cooperation agreement in November 2012 to formalise and reinforce bilateral relations. The cooperation agreement with the JRC will facilitate the provision of science based policy advice to European Institutions and to enter a long term structured dialogue. We look forward to a continuous implementation of the agreement in five priority areas: Energy, Transport and Mobility, Innovation, Education and Training, Technology and Society.

Euro-CASE is now launching a European “energy platform”, co-chaired by Ottmar Edenhofer from Germany (for acatech), who is also a

member of the Intergovernmental Panel on Climate Change (IPCC), and Bernhard Tardieu from France (National Academy of Technologies of France) and we very much welcome the participation of the JRC in the constituting phase and future endeavours of the platform. The platform will focus specifically on issues mentioned in the Green

Paper “A 2030 framework for climate and energy policies” and the European Commission communication on “Energy Technologies and Innovation”.

Another topic of mutual interest is the question of public acceptance of new technologies. Therefore, I highly welcome the Round Table between the JRC and Euro-CASE on the theme “The dialogue between science, technology and society around two cases: energy and climate change” held in Brussels on 19 September 2013. The objective is to identify how our societies perceive important technological changes and to analyse key factors which are necessary to facilitate a better interaction between science, technology and society. The development of a strong cross-border dialogue between scientists, engineers, entrepreneurs, business leaders, civil society and policy makers becomes more and more necessary to address major societal challenges of our time.

Reinhard F. Hüttel,
Chairman of Euro-CASE, President of the National
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Signature of the
agreement between
Euro-CASE and the JRC,
Paris, November 2012.



EU and US extend scientific co-operation on standards and measurements

To help reach the goal of having compatible standards across both sides of the Atlantic, the JRC and the US National Institute of Standards and Technology (NIST) agreed on 17 July to expand their current scientific co-operation to 10 different areas. The JRC-NIST Implementing Arrangement is particularly relevant in the light of the currently negotiated Transatlantic Trade and Investment Partnership (TTIP).

Besides removal of tariffs aimed at facilitating trade and investments on the other side of the Atlantic, the negotiations will address those barriers that lie behind the customs border – the unnecessary rules and regulations, resulting from

different standards. The JRC-NIST Implementing Arrangement encompasses 10 (non-exhaustive) areas related to standards and measurements. Environment and climate, energy, transport, and security feature high on the collaborative research agenda. Healthcare and clinical measurements, food safety and nutrition, as well as nanotechnology will be subject of the development and harmonisation of methods, indicators and documentary standards. Besides reference materials in a range of areas, the co-operation will include research on civil engineering structures and emerging information and communication technologies (ICT), as well as marine optical radiometry.



JRC Director-General Dominique Ristori and NIST Director Patrick Gallagher sign the Implementing Arrangement at the US Congress in Washington D.C. At the left, US Congressman Chaka Fattah; at the right MEP Edith Herczog.

E-vehicles and smart grids: First EU-US Interoperability Centre opens for business

The first of the twin centres designed to promote common standards in electro-mobility and smart grids on both sides of the Atlantic was inaugurated near Chicago on 18 July. The interaction between smart grids and electric vehicles will allow for more widespread use of renewable energies in electricity systems, thus facilitating the way to a low-carbon economy. Compatible standards and interoperability in this field will benefit the European energy landscape, while converging transatlantic technical regulations could lead the way to global standards.

The launch of the Interoperability Centre for electric vehicles and smart grids is the fruit of 18 months of dedicated work following the Letter of Intent (LoI) for closer co-operation, signed by the JRC and the US Department of Energy (DOE) in 2011. The Centre is hosted at DOE's Argonne National Laboratory near Chicago. The second Centre will be opened in the EU, at the JRC sites

in Petten, The Netherlands, and in Ispra, Italy, in 2014.

In the context of the importance of the future free trade agreement for converging standards across the Atlantic, the work of the twin Interoperability Centres will play a scene-setting role for technology harmonisation in the two biggest world economies.



Read more:

More information on the JRC's research on standards and measurements: http://ec.europa.eu/dgs/jrc/downloads/jrc_science_for_standards_reports.pdf

Co-operation between the JRC and the US: http://ec.europa.eu/dgs/jrc/downloads/jrc_country_leaflet_us_en.pdf

NIST: <http://www.nist.gov>

Read more:

JRC leaflet on electromobility: http://ec.europa.eu/dgs/jrc/downloads/jrc_2011_electromobility_leaflet.pdf

DOE's Argonne National Laboratory: <http://www.anl.gov/>

Cutting the ribbon at the Argonne National Laboratory near Chicago, USA.

Scientific support to energy security in the Baltic Sea Region

In the first week of its Council Presidency, the Lithuanian Foreign Affairs Ministry and the JRC co-organised a conference in Vilnius on 4 July, exploring how science can contribute to

addressing the challenges and opportunities of energy security in the Baltic region. The focus of the event was on energy production, storage, transmission and distribution.



Energy security is one of the priorities of the Lithuanian Presidency of the EU.

It also aimed at providing scientific support to the implementation of strategic projects being carried out under the framework of the Baltic Energy Market Interconnection Plan, launched by the Commission in 2009.

Energy security is a pressing issue in the Baltic region and is one of the priorities of the Lithuanian Presidency during the second half of 2013. Moreover, it is an EU-wide challenge, as more than 50% of Europe's energy consumption currently comes from external sources. The JRC assesses how different policy options help shape an energy system resilient to shocks and adverse trends whilst satisfying the society's energy needs.

The conference included the participation of Mr Algirdas Butkevičius, Prime Minister of Lithuania, Mr Linas Linkevičius, Minister of Foreign Affairs of Lithuania, Mr Dainius Pavalkis, Minister of Education and Science and Mr Aleksandras Spruogis, Vice-Minister of Energy, the JRC Director-General, Dominique Ristori, as well as other distinguished speakers from the EU and the Baltic region.

Upgraded solar installation inaugurated

New solar facilities were inaugurated on 24 June at the JRC's European Solar Test Installation (ESTI) in Ispra. The upgraded laboratories allow ESTI to assess the performance of new and improved photovoltaic (PV) devices, to perform pre-normative research and to help develop international standards. Photovoltaics are strategically important for competitive renewable

energies, and have a long-term potential for increased efficiency (from 14% of current PV cells to over 60%).

ESTI is a reference laboratory aimed at verifying technological achievement, enabling European R&D efforts in this area to translate into commercial products. Its role is to build confidence in the comparability of measurements of PV devices by the production and dissemination of validated methods, reference measurements, interlaboratory comparisons and training.

The €3 million modernisation project will allow ESTI to keep pace with the rapidly evolving PV market and to address forthcoming standardisation issues. New capabilities include, for example, power calibration for thin film, concentrated or organic PV, which will contribute to the promotion of innovation in PV technologies in the EU. This new instrumentation allows verification of both initial and long term performance of new photovoltaic prototypes and products.



The new Apollo large-area steady-state simulator opens the door to new measurements on advanced products as it provides full sunlight conditions over a 2mx2m test area for up to 8 hours.

Keeping a close eye on natural hazards

To reduce risk of disasters for communities worldwide and support co-ordination of emergency response, the JRC has designed a series of interactive platforms and tools which forecast or monitor the unfolding of devastating events.

Earthquakes, tsunamis or hurricanes take away lives, destroy infrastructure and upset ecosystems. Floods, wildfires and droughts can affect agriculture, energy production, transport and public water supply. In developing countries, they cause famine, illness and more poverty, resulting in migration and recurrent humanitarian crises.

Between 2002 and 2011 natural disasters claimed the lives of about 137,000 Europeans, whereas over 1.1 million people were killed worldwide. In the EU, direct economic losses amounted to €100 billion between 1998 and 2009. This makes it the third most affected region in the world (after the Americas and Asia).

Early alerting: race against time?

The JRC manages highly advanced computer-based early-warning systems to provide reliable information on the basis of solid scientific data to reduce the impact of droughts, floods and fires.

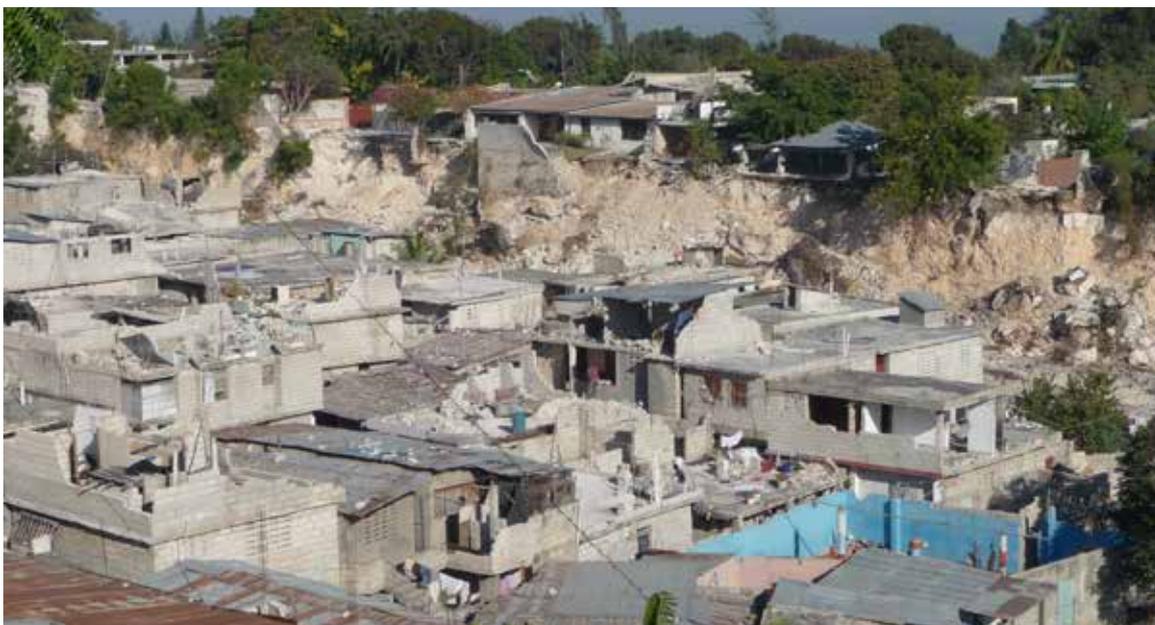
Based on hydrological models, the European Flood Awareness System (EFAS) complements the EU Member States' forecasting systems by predicting the potential for floods in Europe up to 10 days in advance. During the severe flooding

that hit central Europe in June, EFAS alerted the relevant national authorities and the European Commission's Emergency Response Centre (ERC) days in advance with reports of potential

The Global Disaster Alert and Coordination System (GDACS), jointly developed by the JRC and the United Nations, is a web-based platform that monitors and alerts for earthquakes, tsunamis, floods, tropical cyclones and volcanic eruptions. GDACS combines information on the event, the population in the affected area and their vulnerability. The system automatically sends alerts via e-mail, fax or SMS to more than 20,000 users worldwide, including rescue services, civil protection, humanitarian organisations and governmental departments.

GDACS includes the JRC's Tsunami Assessment Modelling System, which can quickly estimate wave height and travel time of tsunamis based on its global historical tsunami scenario database. It provides a preliminary, immediate estimate of the impact as soon as the epicentre of the real earthquake is known. The system includes a Tsunami Alerting Device (TAD) which delivers warning messages to the population at risk. A prototype is currently in operation in Setubal (Portugal).

flooding of the rivers Danube and Elbe and their tributaries. Similar to EFAS, the Global Flood Awareness System (GloFAS) was developed to predict large-scale floods with more than 15 days



Earthquakes, tsunamis and hurricanes take away lives and destroy infrastructure.

Read more:

ELSA:
<http://elsa.jrc.ec.europa.eu/>

GDACS:
<http://www.gdacs.org/>

EFAS:
<http://www.efas.eu/>

Read more:

GloFAS:
<http://gdacs.org/flooddetection/>

EDO:
<http://edo.jrc.ec.europa.eu/>

EFFIS:
<http://forest.jrc.ec.europa.eu/effis/>

of lead-time worldwide. During its testing phase it correctly forecasted floods in Asia.

In a world heavily dependent on the interconnection between electronic communication and power networks, monitoring possible threats by extreme space weather events has become increasingly important. This year is supposed to be the year of the solar maximum, the peak of the 11-year sunspot cycle. Current work at the JRC focuses on how solar storms could affect satellite receivers by geomagnetically-induced currents. With the support of international partners, the JRC has installed two stations in Peru and Vietnam to monitor the scintillation – the flickering of global navigation satellite systems signals – caused by solar activity, to understand and improve the resilience of satellite receivers.

The European Forest Fire Information System (EFFIS) monitors the forest fire situation in Europe and the Mediterranean basin and provides fire danger forecasts up to six days in advance. Fires are monitored and mapped by EFFIS, which provides near-real time estimates of fire damage across Europe, North Africa and the Middle East. Work is on-going for the extension of fire monitoring activities on a global scale in the so-called Global Wildfire Information System (GWIS).

According to the JRC report 'Forest Fires in Europe, Middle East and North Africa 2012' published in August, last year – with a burnt area of 646,157 hectares in the EU28 – was sadly well above the average 470,000 ha of the previous 20 years. Spain was by far the most affected EU country in 2012 (209,855 ha, worst year since 1994), followed by Italy (130,814 ha) and Portugal (110,231 ha).

Through the European Drought Observatory (EDO), the JRC monitors, assesses and forecasts



Fabio Taucer at the set-up for testing bridge piers.

droughts across the entire European continent. Similar systems for Africa and South and Central America are under development in collaboration with operational and academic organisations in the affected regions. The EDO shall further act as the European contribution to an evolving Global Drought Information System (GDIS).

Safer construction saves lives and keeps buildings standing

Earthquakes and tsunamis have caused extensive damage throughout the world in the past decade (Sumatra 2004, Wenchuan 2008, Haiti 2010, Japan 2011). Europe hasn't been spared. From around 500,000 earthquakes that occur each year worldwide, 100 cause damage. Most of the casualties and destruction are due to the collapse of inadequate constructions.

The JRC's European Laboratory for Structural Assessment (ELSA) hosts a unique experimental reaction wall facility, capable of simulating the earthquake response of full scale models of buildings and infrastructures. In collaboration with leading laboratories in earthquake engineering in the world, the JRC has actively contributed to pre-normative research for the calibration of the European standards for construction, known as the Eurocodes. They provide EU-wide uniform safety levels for buildings and infrastructures. The Eurocodes not only serve to design new, safer buildings, but also to assess the performance and upgrading of existing ones.

At present, ELSA is carrying out near to full-scale experiments to study the seismic performance of reinforced concrete highway bridges built in Italy in the late 1950s, and the effectiveness of innovative isolation systems for retrofit.

Fabio Taucer, scientific officer at ELSA, survived his first earthquake in Venezuela as a one-year old baby. He was taken away to safety a few days before the building where he was staying with part of his family collapsed during the 1967 Caracas earthquake. This building became a case-study and an example of how structures fail when columns are poorly designed. After graduating in Civil Engineering, Fabio moved to the USA where he obtained a Master of Engineering from the University of California. He arrived at Berkeley in 1989, a month before the Loma Prieta earthquake struck, causing extensive damage and fatalities in the San Francisco Bay Area. This led to new, challenging work such as the seismic retrofit of the Golden Gate Bridge which opened the doors to Fabio's career in earthquake engineering.

Six EU Member States among the world's 10 most innovative nations

Six European Union Member States are amongst the top ten most innovative nations (Sweden (2), United Kingdom (3), Netherlands (4), Finland (6), Denmark (9), Ireland (10)), while Switzerland retained its place atop the rankings in the Global Innovation Index (GII) 2013, published by Cornell University, INSEAD, and the World Intellectual Property Organization (WIPO). The index was submitted, for the third consecutive year, to an independent statistical audit by the JRC. The JRC recommendations, aimed to ensure the

Top Ten 2013 ranking			
1	Switzerland (Number 1 in 2012)	6	Finland (4)
2	Sweden (2)	7	Hong Kong (China) (8)
3	United Kingdom (5)	8	Singapore (3)
4	Netherlands (6)	9	Denmark (7)
5	United States of America (10)	10	Ireland (9)

The top ten GI 2013 ranking.

overall conceptual and statistical coherence of the GI 2013, were taken into account in the final computation of the rankings.

The GI 2013 looked at 142 economies around the world, using 84 indicators including the quality of top universities, availability of microfinance, and venture capital deals - gauging both innovation capabilities and measurable results.

The GI 2013 is calculated as the average of two sub-indices. The Innovation Input Sub-Index gauges elements of the national economy which embody innovative activities grouped in five pillars: (1) Institutions, (2) Human capital and research, (3) Infrastructure, (4) Market sophistication, and (5) Business sophistication. The Innovation Output Sub-Index captures actual evidence of innovation results, divided in two pillars: (1) Knowledge and technology outputs and (2) Creative outputs.

Read more:

JRC work on composite indicators:
<http://composite-indicators.jrc.ec.europa.eu>

GI2013:
<http://www.globalinnovationindex.org/>

Improving EU innovation in three ICT sub-sectors

A combination of different policy options is needed to improve the EU's innovativeness in web services, industrial robotics and display technologies according to a JRC report which documented the innovation gaps between the EU and the US in these three specific ICT sub-sectors.

With its 15 case studies, the analysis brings a nuanced picture of firms in different countries having strengths in different sub-sectors: European companies appear ahead of the US in industrial and service robotics, while the Americans are more successful in developing military robots. It is hence not just a matter of the EU lagging behind the US. The findings show that very diverse factors are essential for corporate success and that the EU's innovative performance could be improved through excellence in education, innovation-friendly environments and financial and non-financial public support.

The experience in the US clearly shows that strong links between universities and firms can lead to successful innovation. Indeed, Stanford University has had a tremendous impact on the emergence of high-tech companies in Silicon Valley, from Hewlett Packard to Google. The success of Amazon further illustrates the importance of a business-friendly climate,

efficiency and a single market. Low administrative costs and tolerance towards business failure can also contribute to a better innovation environment.

Public funding can be crucial for the viability of an innovative enterprise as showcased by the USA's iRobot Corporation whose business in advanced robotics was considered far too risky by private venture capitalists. Non-financial government support can prove to be an important innovation-driver as well.

Read more:

Comparing Innovation Performance in the EU and the USA – Lessons from three ICT Sub-Sectors:
<http://ftp.jrc.es/EURdoc/JRC81448.pdf>



EU and US companies display strengths in different ICT sub-sectors.

Taking account of uncertainty in agricultural market projections

Read more:

JRC Reference Report on Partial Stochastic Analysis (2013):

<http://publications.jrc.ec.europa.eu/repository/handle/111111111/28678>

The influential OECD-FAO 2013 Agriculture Outlook published recently included JRC's partial stochastic analysis of agricultural market projections. The Outlook projects a slow-down in the medium-term expansion of world agricultural production because of limited area expansion and slower productivity growth. Agricultural commodity prices in real terms will be held above



Projections point to a slow-down in the medium-term expansion of world agricultural production.

pre-2007 levels by tight market conditions and higher input costs. Agricultural trade is expected to increase, with most of the export growth coming from developing countries.

Partial stochastic analysis attempts to discern the relative importance of key specific risks. The approach does not attempt to forecast the implications of all possible uncertainties for future market outcomes. Instead, it allows the policy maker to select specific sources of uncertainty and to quantify the likely range of variation around the projected results that derives from them.

This type of analysis has already been used by the JRC in preparing the annual market outlook of the European Commission's Directorate-General for Agriculture and Rural Development, which also uses the AGLINK-COSIMO model. The technique is being further developed within the JRC's agro-economic modelling platform, iMAP, in order to extend it to other iMAP models and increase its user-responsive flexibility.

Short supply chains: more transparency and trust between consumer and producer

Read more:

Short Food Supply Chains and Local Food Systems in the EU. A State of Play of their Socio-Economic Characteristics: <http://ipts.jrc.ec.europa.eu/publications/pub.cfm?id=6279>

The JRC has published a new study on the relevance of short supply chains in the distribution of agricultural and food products in the European Union. It provides policy recommendations to potential legislative proposals on the labelling of products under 'local farming and direct sales' as foreseen by the EU Regulation on quality schemes



Short food supply chains can have positive social and economic impacts.

for agricultural products and foodstuffs (No 1151/2012).

Short food supply chains (SFSCs) are characterised by a minimal number of intermediaries between the producer and the consumer. In most cases, SFSCs overlap with the concept of local produce, and are usually small enterprises that implement organic or environmentally-sound agricultural practices. They include organisation schemes like community-supported agriculture (where consumers support producers and share risks and benefits of food production with them), on-farm direct sales, sales by farmers at the place of consumption (farmers' markets, delivery schemes), and direct sales by farmers to collective catering systems (schools, hospitals).

The report highlights the positive social and economic impact of such organisations. The schemes offer more transparency between consumer and producer, leading to increased consumer knowledge and understanding of food, farming and environmental issues, which in some cases prompts behaviour change. The study draws attention to the advantages and disadvantages of labelling schemes, emphasising the need to achieve the right balance between a potential EU approach and existing regional schemes.

Risk indicators to help assess farmland abandonment

Research carried out by the JRC has developed a composite index that has produced European and national risk indicators of farmland abandonment. The study contributes to the assessment of the risk, which is crucial to the area of agricultural land management.



Risk indicators of farmland abandonment will help to monitor the integration of environmental concerns in the CAP.

Concerns that reductions in EU agricultural support and reforms of trade policy could lead to widespread land abandonment with negative environmental and social consequences have driven the European Commission to set up a system of 28 agri-environmental indicators.

The development of farmland abandonment risk indicators must take into account the differences between Member States (and sometimes within a single country) in the agricultural situation, natural conditions, historic developments and economic and demographic contexts. In order to produce a common risk indicator, composite indices (which describe several drivers with one value) were developed based on the normalised values of the individual drivers. The normalisation procedure was performed at two different levels: (a) the EU-27 level, as an attempt to elaborate a risk index covering the EU-27 in a homogeneous manner; and (b) the Member State level.

New testing strategy for unapproved variety of GM-wheat

Following the announcement by the U.S. Department of Agriculture that an unapproved variety of genetically modified, herbicide resistant wheat was found in a field in Oregon, the JRC, as European Union Reference Laboratory for GMOs, was requested to work out an efficient control system.

A detection method has been made available by Monsanto, who developed the GM-wheat concerned (MON 71800), but its necessary verification will take time. Therefore the JRC, together with the European Network of GMO Laboratories, has developed a testing strategy that allows the confirmation of the absence of this wheat in grain deliveries or wheat-containing

products. It is based upon the combination of validated methods that EU control laboratories already use in their control procedures and it can thus immediately be deployed.



The JRC acts as EU Reference Laboratory for GMOs.

A healthier diet can help protect freshwater resources

A JRC co-authored article published in *Ecological Indicators* has shown that reducing meat consumption could help make significant water savings. According to the study, EU freshwater scarcity could be successfully addressed by analysing the water footprint of consumption (WFcons) patterns.

The study compares four different dietary scenarios. It takes as reference scenario the current average EU-28 diet (based on the period 1996-2005), which is characterised by overconsumption, particularly of animal products. It compares this with a healthy diet (based on the

recommendations of the Deutsche Gesellschaft für Ernährung), a vegetarian diet (which includes dairy products but no meat or fish), and a combination of the two.

The study finds that each of the three alternative dietary scenarios would result in a substantial reduction of the EU-28 water footprint of consumption, with the lowest WFcons resulting from the vegetarian diet scenario. The highest WFcons savings are attributed to a reduction of meat intake, followed by reductions of oil and sugar consumption.

Read more:

Assessing the risk of farmland abandonment in the EU:
<http://publications.jrc.ec.europa.eu/repository/handle/111111111/28427>

This method is available since 13 June at:
<http://gmo-crl.jrc.ec.europa.eu/>

Read more:

The water footprint of the EU for different diets:
<http://www.sciencedirect.com/science/article/pii/S1470160X13000940>

New certified reference materials for environment, food and health

Read more:

CRMs online catalogue:
<http://irmm.jrc.ec.europa.eu/reference-materials-catalogue/catalogue/Pages/index.aspx>

The JRC released eight new certified reference materials (CRMs) together with corresponding certification reports.

A new wastewater material certified for arsenic, cadmium, chromium, copper, mercury, nickel, lead and zinc – named ERM-CA713 – will be used by laboratories participating in the mandatory monitoring of 33 pollutants of EU's surface waters (rivers, lakes, transitional waters, and coastal waters). These chemicals, known as



The new certified reference materials will be used to monitor pollution in the EU's surface waters.

Priority Substances, are listed within the EU's Water Framework Directive 2000/60/EC, which prescribes measures to achieve good water quality.

ERM-DB001 is a new human hair material certified for the content of arsenic, cadmium, copper, iron, mercury, lead, selenium and zinc. It will be used to support monitoring the exposure of humans to heavy metals. A new steel material, ERM-FA013bk, will be used to calibrate Charpy instruments which are used for steel resistance measurements.

A set of five new genetically modified organism (GMO) materials – ERM-BF436a-e – certified for their content of soya modified with GM event DAS-44406-6, will enable GMO testing laboratories to carry out measurements and to implement the food and feed labelling threshold in compliance with EU legislation. In support to EU's laboratories which perform GMO quantification measurements and use reference materials for quality control, method validation and calibration, on 21 and 22 November the JRC will hold a two day training course (course leaflet) at the IRMM premises, aimed at laboratory managers, practitioners and analysts.

Harmonised quality checks of cancer data to help build comprehensive EU wide data system

Read more:

ENCR:
<http://www.encre.eu>

Key European cancer registries stakeholders agreed on 2 July to establish common protocols for quality checks of cancer registry data, a step closer towards a harmonised cancer information system for Europe. The consensus was reached at a JRC-organised workshop as part of the process to improve the quality, reliability and comparability of cancer data in the EU.

Since taking over the administrative function of the European Network of Cancer Registries (ENCR) from the Lyon-based International Agency

for Research on Cancer (IARC – WHO), the JRC has also provided an up-to-date information exchange platform.

The future perspective involves migration of European cancer registry datasets from IARC (where it has resided for almost 25 years) to the JRC. This will give the European Commission full autonomy to report the cancer burden in Europe, to steer and monitor cancer policy interventions as well as provide a very valuable source for epidemiological research in Europe.



The JRC will now host the secretariat of the European Network of Cancer Registries.

Forest biomass use could increase CO₂ emissions in the short term

A JRC literature review questions the 'carbon neutrality' of forest biomass, which the current EU policy framework considers a carbon neutral source for energy and transport. According to the findings the carbon neutrality assumption is not valid in the short term (i.e. 2020) and in the case of biomass from forests.

If all the carbon pools and their development with time are considered in both the fossil fuel and bioenergy scenarios – in most cases the use of roundwood from forests – forest biomass would cause an actual increase in CO₂ emissions compared to fossil fuels in the short term (first decade or more). In the longer term

(decades to centuries), it may generate GHG savings. Furthermore, competition for land and displacement of wood for materials or other sectors – often neglected or underestimated – may also play an important role.

The values for the forest bioenergy carbon debt payback times reported in literature are largely variable, because of the different characteristics and assumptions of both the bioenergy and the reference fossil fuel systems: the fossil fuel replaced, the biomass efficiency, the forest growth rate, the frequency and intensity of biomass harvests, the initial forest carbon stock and the forest management practices.



Read more:

<http://iet.jrc.ec.europa.eu/bf-ca>

There is a conflicting issue regarding forest biomass in that it could cause an increase in CO₂ in the short term, but there are overall benefits in the long term.

Africa's deforestation rates slow down by 50%

In the years 2000–2010, Africa's deforestation rate was halved in comparison to the period 1990–2000, according to a JRC co-authored article in the latest issue of the journal *Philosophical Transactions of the Royal Society B*, which was dedicated to African rainforests and co-edited by the JRC.

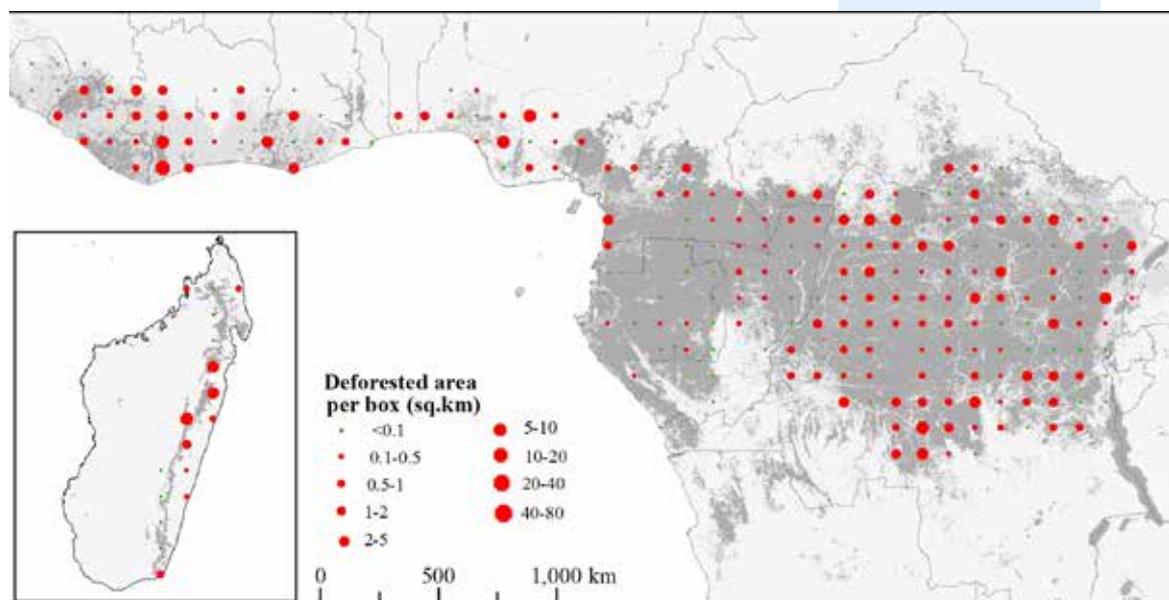
The article presents a new state-of-the-art map of the current extent of Africa's rainforests, accompanied by deforestation measurements, and explores the patterns and drivers of change over two decades. In the period 1990–2000, Africa's rainforests were reduced at an annual rate of 0.28% (i.e. 590,000 ha) compared to 0.14% (i.e. 290,000 ha) in the following decade. During this period, deforestation fell from 0.16% to 0.10% in the Congo Basin, from 0.91% to 0.30% in West-Africa, and from 1.63% to 0.97% in Madagascar.

Net deforestation between 1990 and 2000. The circle size is proportional to the surface affected by deforestation in each sample of 100 km².

Urbanisation, wood fuel collection and agricultural expansion are some of the factors underlying deforestation in the Congo Basin, the world's second largest rainforest area after the Amazon. The slowdown of deforestation can be attributed to the better management of forests produced for timber and to the installation of new protected areas. West Africa and Madagascar have higher deforestation rates, partly due to the high population pressure.

Read more:

Theme issue:
Change in African rainforests: past, present and future
<http://rstb.royalsocietypublishing.org/content/368/1625.toc>



Space sector likely to use terrestrial fuel cell technology

Read more:

<http://publications.jrc.ec.europa.eu/repository/handle/111111111/28200>

The aerospace sector is likely to tap into the automotive hydrogen fuel cell technology in the years to come, according to an article co-authored by the JRC and the European Space Agency (ESA) in the scientific journal *Acta Astronautica*.



Fuel cell testing at the JRC.

Fuel cells, devices that transform the chemical energy of hydrogen into electrical energy through their reaction with oxygen and feed the electricity to run an electric engine, were first employed in space missions in the 1960s. Due to their high efficiency and their water vapour emissions (no CO₂), hydrogen fuel cells have triggered global research efforts to reduce greenhouse gas and air pollutant emissions. Thanks to prototype tests as of the 1990s, fuel cells are at the verge of market deployment in the automotive sector, while the space sector has retired its fuel cells in the summer of 2011, when the last Space Shuttle mission came to a successful end.

Fuel cells could still have several applications in the space sector: high power and energy applications (such as a manned spaceflight and exploration missions), future generation high power telecommunication satellites and space infrastructure of great scale. However, the worldwide R&D investments of the automotive sector outweigh those of the aerospace and defence sector by a factor 5.1 worldwide, and by 4.4 in the EU-27. As space agencies around the world hesitate to develop dedicated fuel cell systems tailored for specific space programmes due to high costs, they will likely use fuel cell technologies developed for terrestrial use.

EU opens CBRN Risk Mitigation Regional Secretariats in Amman and Tbilisi

Read more:

CBRN CoE:
<http://www.cbrn-coe.eu/>

The EU Chemical, Biological, Radiological and Nuclear (CBRN) Risk Mitigation Centres of Excellence (CoE) initiative inaugurated its Regional Secretariats for the Middle East and for South East Europe, the Southern Caucasus, Moldova and Ukraine this summer. The Secretariats will facilitate information sharing, CBRN need assessment in the partner countries, and implementation and monitoring of projects in these regions. In addition, they will promote the regional visibility of the initiative as well as facilitate coordination of CoE activities.

The EU CBRN Risk Mitigation CoE is an EU sponsored initiative launched in 2010 with a budget of € 95 million over four years. In cooperation with the UN's Interregional Crime and Justice Research Institute (UNICRI), the JRC provides technical support and expertise to the European Commission's Directorate-General for Development and Cooperation in implementing of the initiative. A network of CBRN experts is currently present in 42 non-EU countries in eight regions of the world. CBRN risk mitigation projects currently amount to 30.

The JRC has been instrumental in the set up and opening of two other regional secretariats now operating in Manila (South East Asia) and Rabat (African Atlantic Façade). An additional four, in Abu Dhabi (Gulf Cooperation Council Countries), Algiers (North Africa), Nairobi (Eastern and Central Africa) and Uzbekistan (Central Asia) are under preparation.



EU, CBRN centres of Excellence provide for cooperation and coordination between all levels of government and international partners

Through maps and datasets, a digital globe tells JRC stories



The JRC's Steve Peedell has a passion for maps and their effectiveness to communicate scientific information to a wide audience.

Maps have always been Stephen Peedell's great passion. As a child, he remembers being fascinated by his uncle's collection of old maps and atlases. Now, maps are his daily business and his uncle's maps belong to him. He studied geography at university and considers himself fortunate that maps have been a significant aspect of his professional career. He has been working on Geographical Information Systems (GIS) for 25 years, and witnessed enormous changes in technologies for using geographic information. He joined the JRC in 1999 and currently designs GIS for environmental monitoring, mainly for the African, Caribbean and Pacific regions.

His fascination for maps as an efficient communication tool led him to think of new ways to visualise the JRC's work. The technical progress in combining a physical sphere with digital visualisation technology was an interesting option, especially for illustrating the JRC's work on global environmental issues. In 2011, the JRC began working with a rented digital 3-D display – the OmniGlobe – a 150 cm diameter, internally projected sphere that can display and rotate static and animated images, specifically maps of the world and global environmental datasets.

The power of this spinning blue marble to engage an audience became very obvious at the JRC's Open Day in May 2011. Visitors of all ages were fascinated by the compelling displays on the globe that covered the environment and climate change, energy and transport, agriculture and food security, land resource management, natural disasters and public safety.

"People think that you can only display natural features on a globe. But if you give a value to a place or region you can map it and the map tells a story", is how Peedell summarises the potential of the globe to display the JRC's many activities. In 2012, the JRC acquired its own OmniGlobe and Peedell and colleagues compiled many more scientific datasets to create compelling new displays. "Telling a story with the globe has specific challenges, and merely displaying a map is not enough".

Peedell used data on earthquake occurrences from the Global Disaster Alert and Coordination System (GDACS) to display areas at high risk of seismic activity. "If we precede this with an animated reconstruction of the movement of continental plates over geological timescales, our visitors can understand the dynamic nature of the Earth's crust much better, and why earthquake activity is more prevalent in certain parts of the world."

There are now about 25 JRC globe stories. So which is his favourite? Peedell doesn't have to reflect for long. The JRC's global map of accessibility is intriguing – it shows that there are still some truly remote places on Earth despite our increasingly interconnected world. "I'd like to visit them someday" he says, "maybe Mongolia or the Central African forest".

Are there JRC activities such as support to financial stability that are impossible to explain using the globe? "Not really" replies Peedell, "as long as you have values to map, or a message that has some geographical context, anything is possible. Take the recent report on the Global Innovation Index to which the JRC has contributed. You could make a really effective map which clearly highlights that six EU Member States are among the world's 10 most innovative nations".

When it is not rolled out at public science events or JRC conferences, the JRC's globe is hosted at the JRC's Visitors' Centre of the JRC-Ispira site in Italy. Peedell says he goes to see 'his baby' once a week and of course he has a virtual globe on his desktop. "My next favourite theme for the globe will be to map our international visitors coming to all JRC sites and to reflect our strong worldwide collaboration and contacts."

The next challenge he has is to use real time data instead of static data. Up-to-date information on the forest fire risk will certainly be more striking than statistics on where fires occurred over the past four years.

A novel approach to fisheries management

Read more:

a4a initiative:
<https://fishreg.jrc.ec.europa.eu/web/a4a>

a4a model:
<https://fishreg.jrc.ec.europa.eu/web/a4a/code>

A new model to easily assess a large number of fish stocks and process the rapidly accumulating fisheries related information has been developed by the JRC under the Assessment for All (a4a) initiative. It was launched in July during the World Conference on Stock Assessment Methods in Boston.

The a4a assessment tool does not require a strong expert background or modelling expertise, which opens stock assessment to a wider community. It enables the inclusion of more data, technical knowledge on fisheries, stocks or ecosystem characteristics. The a4a

method thus facilitates current fish stock estimations and predicts their future status under alternative scenarios, which is essential for the sustainable and profitable management of fisheries.

The a4a initiative has been developed within a broad network of stakeholders, including scientists and policy makers from a wide range of international institutions such as the UN Food and Agricultural Organisation (FAO), the International Council for the Exploration of the Sea (ICES) and the National Oceanic and Atmospheric Association (NOAA).

COOPERATION AGREEMENTS

Enhanced energy research cooperation with West Africa

Read more:

AFRETEP:
<http://www.euei.net/wg/african-renewable-energy-technology-platform-afretep>

The JRC and the Centre for Renewable Energy & Energy Efficiency (ECREEE) of the Economic Community of West African States (ECOWAS) signed a Memorandum of Understanding (MoU) to enhance their cooperation. This cooperation framework will facilitate the development of common tools (e.g. country specific maps with renewable energy based electricity costs), validation of results and their publication. In addition, it will reinforce the network between the JRC and regional partners for African-related research activities in the field of renewable energies and energy efficiency.



Mahama Kappiah, Executive Director of ECREEE, and Giovanni de Santi, JRC-IET Director, sign the MoU.

PAST EVENTS

5th International Conference on Hydrogen Safety

Read more:

ICHS 2013:
www.ichs2013.com

The JRC hosted the 5th International Conference on Hydrogen Safety (ICHS 2013) which sought to improve trust in hydrogen technologies and increase public awareness, by promoting a better understanding of the hazards and risks associated with hydrogen. The three-day conference, held in Brussels, was organised under the auspices of the

International Association for Hydrogen Safety.

The conference attracted around 200 policymakers, industry representatives and researchers, more than half of them coming from non-EU countries, including Japan, China, Brazil, Russia, Korea, USA and Canada.

Energy Transition from a European perspective - roundtable

In the context of the European Forum for Science and Industry, the JRC organised a high-level roundtable on 'Energy Transition from a European perspective' on 22 July in Brussels. The discussion focused on how renewables

should best be integrated into the grid and the energy market, how the increased flexibility and adequacy needs can be provided at least cost, and what role regional cross-border initiatives could play.

The roundtable led to a science-based understanding of the electricity system challenges, which will be used when formulating policy recommendations for the further transformation of the energy and infrastructure sector.



From left to right: Jos Delbeke, Aleksandras Spruogis, Dominique Ristori, Detlef Dauke, and Philip Lowe at the 'Scientific support to capacity markets and the integration of renewable energy' roundtable.

Young science competition winners visit the JRC

Some of Europe's best young scientific minds met with the JRC's experienced researchers in the laboratories at Ispra (Italy) and Geel (Belgium) during July. The young scientists were winners of the European Union Contest for Young Scientists (EUCYS) who spent a week at the JRC, and 10 successful participants of the German 'Jugend forscht' competition who joined for two days.

The awardees had impressed the competition judges with projects and inventions such as a controlled pill box, a biologically inspired robot, resistance development to antibiotics, lactose-free food, improvement of the climate of their home town, and innovative ways to measure temperatures or flow velocities.

UPCOMING EVENTS

High level meeting – 'Building a Transatlantic Scientific Bridge on Eco-Industries'

To examine the scientific potential in support of the eco-industry sector on both sides of the Atlantic, the JRC with the cooperation of the US mission to the EU is organising a high-level meeting 'Building a Transatlantic Scientific Bridge on Eco-Industries' on 26 September in Brussels.

The event will build upon the JRC high-level conference that took place in May 2012 and will explore synergies in the area of eco-industries between the EU and the US in the light of the latest efforts by the two largest world economies to work towards converging standards.

CONCORDi-2013: 4th European Conference on Corporate R&D and Innovation

The 2013 edition of the biennial European Conference on Corporate R&D and Innovation will be held on 26 and 27 September at the JRC's Institute for Prospective Technological Studies (IPTS) in Seville, Spain. More than 100 leading scientists and experts will discuss innovation

financing for company growth – a particularly important topic in times when too many enterprises in Europe continue to face severe financial constraints, while policy makers strive to find solutions.

28th European Photovoltaic Solar Energy Conference and Exhibition

Europe's most important event in photovoltaic solar energy – the European Photovoltaic Solar Energy Conference and Exhibition (PVSEC) – will take place from 30 September to 4 October in Paris. The JRC provides the technical coordi-

nation to the programme, dedicated to the role of photovoltaics as a major electricity source, with a particular focus on energy storage, grid integration, e-mobility and PV building applications.

Read more:

EU PVSEC 2013:
<http://www.photovoltaic-conference.com/>

Jobs at the JRC:
<http://www.jrc.ec.europa.eu/jobs>

Jobs at the JRC

Recently published – Applicants must submit their application no later than the indicated deadline

Ispra, Italy:

Ph.D. student (Cat.20)

- Climate and Development – Climate resilience as drivers of Sustainable Development and green growth – **30 September**

Senior researcher (Cat.40)

- Senior scientist expert in nutrition in developing countries – **7 October**

Brussels, Belgium:

Auxiliary Contract Staff (FG IV)

- Policy analyst – Content analysis (Country desk) – **22 September**

Auxiliary Contract Staff (FGIV)

- Policy Analyst - Content analysis (Country desk) – **22 September**

Auxiliary Contract Staff (FGIV)

- Foresight Expert – **30 September**

Auxiliary Contract Staff (FGIV)

- Policy Expert – **30 September**

Petten, The Netherlands:

Auxiliary Contract Staff (FG II)

- Logistics Support Officer - **29 September**

Karlsruhe, Germany:

Senior researcher (Cat.40)

- Nuclear and Radiological Security – **7 October**

Ph.D. student (Cat.20)

- Contrasting the mechanisms of conventional and spark plasma sintering of nuclear fuels – **4 November**

Seville, Spain:

Senior researcher (Cat.40)

- Key Enabling Technologies Techno-economic Analysis – **3 October**

Senior researcher (Cat.40)

- Regional Economic Modelling – **7 October**

The JRC Newsletter is a bi-monthly publication intended to provide JRC customers, stakeholders and other interested parties with an overview of recent highlights from the JRC's scientific achievements, policy support, contributions to events and other news.

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As the Commission's in-house science service, the Joint Research Centre's mission is to provide EU policies with independent, evidence-based scientific and technical support throughout the whole policy cycle. Working in close cooperation with policy Directorates-General, the JRC addresses key societal challenges while stimulating innovation through developing new methods, tools and standards, and sharing its know-how with the Member States, the scientific community and international partners.

