



JRC Newsletter

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Editorial



Europe's current road transport system, like that of other continents, is far from sustainable in the long run. Monitoring its environmental impact and securing its energy supply is a twofold challenge, but also an opportunity. In addressing these issues, there are two possible and even

connected ways forward for policy development and technological progress. One is reducing the impacts of road transport on the environment, specifically air pollution and climate change, and on human health, for instance from particles and ozone. The second way is reducing demand for finite energy supplies by increasing the energy efficiency of our vehicles. The latter also implies preparing the fleet on our roads to run on a more diversified range of energy sources. Both of these ways are pursued at the JRC's Vehicle Emissions Laboratories (VELA) in Ispra.

As one of the global technological leaders in this field, the EU continues its efforts not only to promote, but also to develop greener transport. Legislation for cleaner vehicles needs to be technically and scientifically sound. VELA has played and continues to play a key role in supporting the development of policy measures. VELA laboratories are currently used in defining the implementation of the new European legislation on CO₂ emissions of cars as approved by the Council and the European Parliament in December 2008.

As Janez Potočnik, our Commissioner for Science and Research, said earlier this month at the opening of the new VELA 7 laboratory for testing lorries and buses, we can be proud of our technicians and scientists, who have brought this innovative installation into timely operation. Their work and enthusiasm has resulted in a design enabling our support for the forthcoming EURO VI emission standard for heavy duty vehicles. Indeed, its implementing guidelines must be defined by April 2010. But in VELA 7 the two

abovementioned ways come together; the emissions and the fuel-efficiency of heavy-duty vehicles can both be scrutinised, even if they are interdependent. We will use it to assess the greenhouse gas and pollutant emissions of advanced and alternative vehicle concepts. Its climatic chamber allows testing at a broad range of temperatures. With a built-in capacity to look into alternative fuels such as compressed natural gas, biofuels and hydrogen, the lab can analyse their emissions and their compatibility with existing engine and after-treatment technologies. VELA 7 is a good example of the JRC's foresight role: of tackling the challenges of today as well as those of tomorrow.

The JRC planned and constructed VELA 7 through its working relationship with the Lombardy Region, including contractual agreements on air quality monitoring and vehicle emission testing. VELA 7 was opened by Commissioner Janez Potočnik together with the President of the Lombardy Region, Roberto Formigoni, in honour of our Memorandum of Understanding with the regional government. Like the JRC's other reference laboratories, VELA 7 will be a flagship for European researchers, industry and international stakeholders, by providing independent and scientifically sound research services and support to policy making.

LEEN HORDIJK
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for Environment and Sustainability*

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Greener road transport: JRC opens VELA7

On 13 March the European Commissioner for Science and Research Janez Potočnik came to the JRC Institute for Environment and Sustainability (IES) in Ispra, Italy, to open a new facility at its Vehicle Emissions Laboratory (VELA).

The new JRC 'VELA7' laboratory is the most advanced in Europe for testing the fuel consumption and related emissions of full size lorries and buses under simulated road driving conditions within a broad, realistic temperature range. The laboratory can host vehicles of up to 40 tonnes in weight and 12 metres in length, and can simulate elements such as wind drag and tyre/road friction in order to carry out precise and realistic tests. VELA7 will provide sound scientific data needed to support new legislation such as the forthcoming 'Euro

VI' guidelines on emission limits for heavy duty vehicles.

The new facility will complement the JRC's existing capacity to test every type of engine and vehicle

in Europe, from lawnmowers and motorbikes to vans and tractors.

<http://ec.europa.eu/dgs/jrc/index.cfm?id=5420&mp>



Emission test facility for heavy duty vehicles – Emission test on a lorry

The 'phantom menace' of a patent on... your genes

In the 26 March edition of Nature, scientists from the JRC Institute for Prospective Technological Studies (IPTS) have published results from an on-going study conducted together with the European Techno-Economic Policy Support Network (ETEPS) and with the support of EuroGentest, an EU-funded Network of Excellence (NoE) in the domain of genetic testing.

The study, entitled "Intellectual Property and Diagnostics", contains a compilation of evidence on where and how laboratories are exploiting DNA patents. It analyses the impact of this behaviour on European companies and clinical laboratories engaged in the development and provision of genetic tests and socio-economic consequences for the development of diagnostics and patient access to these diagnostics.

The purpose of such prospective studies, the speciality of the JRC IPTS in Seville, Spain, is to assess whether regulation at a European level in a given area is required.

Conducted across Europe, the study notes that genetic testing laboratories have generally had little experience of dealing with patents and require more support to negotiate the changing patent landscape around them. However, in many cases laboratories also lack awareness, experience and support to resolve patent-related issues, in an environment where patents are of increasing prominence. Private and public health insurers may thus end up having to provide more support due to increased costs relating to patented tests.

The concept of Intellectual Property Rights (IPR) is generally considered an important incentive for innovation as it facilitates the sharing of new knowledge and its

application (invention) with the scientific community and society as a whole. In spite of its stimulating effect on innovation, it has been suggested that intellectual property also has the potential to inhibit research as a result of the proliferation of DNA patents, resulting in limited access to novel treatments and diagnostics, for example as a result of high licensing fees. Yet little empirical evidence exists on the actual impact that current patenting and licensing practices may have for the development and wider adoption of diagnostics. The study aims to fill this void.

Sibylle Gaisser, Michael M. Hopkins, Kathleen Liddell, Eleni Zika & Dolores Ibarreta, "The phantom menace of gene patents", Nature 458, 407-408 (26 March 2009) | doi:10.1038/458407a

<http://www.nature.com/nature/journal/v458/n7237/full/458407a.html>

Assessing food security and preventing food crises

Food insecurity is one of the greatest challenges of today with almost one billion people undernourished worldwide. This number has been growing due to recent instability in food prices. The current economic crisis and climate change prospects are among the possible aggravating factors for the years to come.

The JRC Institute for the Protection and Security of the Citizen (IPSC) is one of seven international organisations¹ working together to implement the Integrated Food Security Phase Classification (IPC).

The IPC is a standardised scale that integrates food security, nutrition and livelihood information in a clear statement about the nature and

¹ Care International, European Commission (JRC), FAO, FEWS NET, Oxfam GB, Save the Children UK and US, WFP.

severity of a crisis and implications for strategic response. It provides a common language and reference on the basis of which all stakeholders can agree on the analysis of the food security situation and possible response options.

The IPC covers the full spectrum of situations - from 'food-secure' to humanitarian crisis - and takes account of the multiple dimensions of food security, i.e. availability, access and nutrition. It provides a comprehensive framework of concepts, indicators, scales or benchmarks and a common, internationally accepted language.

Scientists at the JRC-IPSC contribute to this joint effort by providing updated crop monitoring information and expertise on agricultural production and by participating in IPC seminars in countries where the IPC is being deployed (for instance Uganda, Ethiopia, Kenya). Moreover, JRC-IPSC provides input to the

development of technical tools such as the IPC technical manual, an updated issue of which will be released in July 2009.

<http://mars.jrc.ec.europa.eu/mars/about-us/FOODSEC>



Recommendation on nuclear security systems

The JRC has contributed to a Recommendation² by the European Commission published in February on the implementation of Nuclear Material Accountancy and Control (NMAC) systems by operators of nuclear installations.

The Recommendation provides guidelines for EU Member States on quality assurance in NMAC systems in the framework of Commission Regulation (Euratom) 302/2005 on Nuclear Safeguards. As well as emphasising the importance of measurement quality assurance and quality record keeping, the document provides detailed guidelines for material tracking, material balance procedures and for the assignment of quality management responsibilities.

Assuring that nuclear materials in legally declared civil activities

²Official Journal (L41, Volume 52, 12/02/2009)

remain fully accounted for is a key element in ensuring that dangerous materials are not diverted for illicit use.

At the request of the European Commission's Directorate General for Energy and Transport, JRC scientists recently participated in a number of test-audits at European reprocessing facilities, discussing elements of the new approach both with operators and authorities and providing dedicated training sessions on the topic. Finalising the recommendation involved extensive consultation with national authorities in EU Member States and operators of nuclear facilities.

<http://ipsc.jrc.ec.europa.eu>

Report on 'Learning 2.0'

The JRC Institute for Prospective Technological Studies (IPTS) has published a report entitled "Review

of Learning 2.0 Practices: Study on the Impact of Web 2.0 Innovations on Education and Training in Europe".

The study was carried out as part of a joint project between the JRC-IPTS and the European Commission's Directorate General for Education and Culture. Its objective was to investigate the innovative and inclusive potential of social computing applications in formal education by reviewing current practice.

The report identifies, structures and analyses existing Learning 2.0 practice in Europe with a view to generating evidence on the impact of social computing for learning and its potential in promoting innovation and inclusion. It combines a review of research on Learning 2.0 with the collection of experience and good practice from a broad variety of cases.

<http://ipts.jrc.ec.europa.eu/publications/pub.cfm?id=2059>

JRC conducts forensic analysis of materials from 1940s German nuclear programme

On 19 March the JRC released details of nuclear forensic work carried out on samples dating back to the early days of the technology's history: from Germany's World War II programme. At a workshop for journalists on nuclear security and forensics held at the JRC's Institute for Transuranium Elements (ITU) in Karlsruhe, Germany, JRC scientists presented the results of nuclear forensic investigations into two samples dating back to the first German

nuclear energy project, thought to have begun in 1939.

One sample, a uranium metal cube, was obtained from the Haigerloch Atomic Museum in Baden-Württemberg and originated from the German "Uranverein" nuclear programme under the scientific leadership of 1932 Nobel Prize Winner for Physics, Werner Heisenberg. The second sample, a uranium metal plate, was obtained from the Max Planck Institute for Nuclear Physics in Heidelberg and is thought to have played a part in the work of Heisenberg's fellow researcher, Karl Wirtz.



Loading of a particle sample in the airlock system of the SIMS (secondary ion mass spectrometer)

At the press workshop, over 30 journalists from across the EU were allowed a glimpse inside the JRC's high security nuclear laboratories for a unique first-hand experience. No other civil laboratory in Europe offers such a broad spectrum of analytical capabilities for nuclear materials as JRC-ITU, where specialists can trace nuclear materials back to the facility in which they were produced, like a bullet back to its gun. These facilities include:

- forensic laboratories with sophisticated mass spectrometers, fingerprint and DNA facilities;
- microscopy laboratories, with scanning and transmission electron microscopes, which have been specially modified for operation with contaminated samples;
- particle-analysis laboratories, which consist of highly sensitive mass spectrometers (SIMS), optical microscopes and a clean rooms for the preparation of particle samples.

http://ec.europa.eu/dgs/jrc/index.cfm?id=2820&obj_id=312&dt_code=HLN

Measuring the toughness of steel

The JRC's Institute for Reference Materials and Measurements (IRMM) has released two new certified reference materials (CRMs) to help analytical laboratories assess the impact toughness of steel. This is an important quality parameter in the steel industry and it is measured using standardised impact machines (*Charpy* pendulum impact tests). The standard requires laboratories to verify the proper functioning of their equipment on a regular basis through the use of

certified reference materials such as those produced by IRMM.

Both new reference materials were prepared in an inter-comparison of the laboratories of national metrology institutes of Germany (BAM), France (LNE), USA (NIST), Republic of Korea (KRISS), JRC-IRMM and a number of other European laboratories.

More new reference materials

IRMM has also developed and released a new medical reference

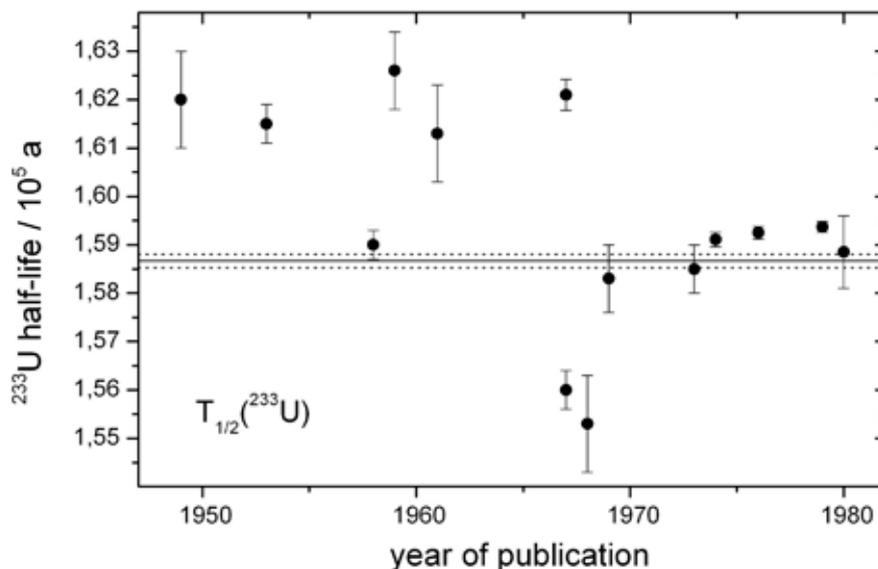
material for the quantification of an important inflammation and tissue-damage marker, the C-reactive protein (CRP). CRP is frequently used to diagnose bacterial and viral infections, to assess disease activity in inflammatory conditions like rheumatoid arthritis, and to determine long-term risk of cardiovascular disease and heart attacks, making it one of the most important analytical tools in clinical chemistry.

<http://irmm.jrc.ec.europa.eu>

Reassessing the half-life of uranium isotopes

Accurate half-life data for long-lived uranium isotopes, such as ^{233}U , ^{235}U and ^{238}U , is of crucial importance in a wide range of scientific applications, including α -particles spectrometry, reactor physics, geochronology and radiological dating. However, knowledge of the half-lives of these uranium isotopes is still based on a limited number of measurements performed decades ago.

In collaboration with three European metrology institutes, the JRC Institute for Reference Materials and Measurements (IRMM) has taken the initiative to reassess and accurately determine the half-lives of ^{233}U , ^{235}U and ^{238}U using state-of-the-art techniques. These experiments involve the combination of traceable mass metrology for establishing the amount of material, mass spectrometry to determine the isotopic composition of the highly enriched uranium materials and primary standardisation techniques to measure the specific activity of a known amount of the radionuclide.



Overview of the published measured values of the ^{233}U half-life and their year of publication. The horizontal line corresponds to the ^{233}U half-life (with combined standard uncertainty) recently obtained by JRC-IRMM and collaborators

JRC-IRMM is in a unique position for this type of work as it hosts all the necessary facilities and know-how, with additional precision and confidence provided by the measurements performed by collaborating metrology institutes.

A new value for the half-life of ^{233}U was determined at $1.5867 (14) \times 10^5$ years. A thorough treatment of

the uncertainty budget was also performed, which was not always the case in the past. The new value provides additional evidence to exclude previously-measured outlying values.

<http://irmm.jrc.ec.europa.eu/>

An international approach to reducing ozone pollution

Scientists from the JRC Institute for Environment and Sustainability (IES) have co-authored an international, peer-reviewed scientific paper detailing the results of a model study evaluating the



Ozone levels in surface air are a public health concern

potential gains from an international approach to abating ozone (O_3) pollution.

Looking at the regions of Europe, North America and East and South Asia, the report evaluates how a reduction of 20% in ozone precursor emissions would affect ozone concentration in and across the regions.

“Multi-Model Estimates of Intercontinental Source-Receptor Relationships for Ozone Pollution”, Journal of Geophysical Research 114; 2009, pp. Do4301-1 Do4301-21.

<http://www.gfdl.noaa.gov/reference/bibliography/2009/aff0901.pdf>

New additions to the JRC technology portfolio

Several new technologies have been added to the JRC technology

portfolio, an on-line catalogue presenting new technologies from the JRC available for licensing or collaborative use.

While the JRC’s principle mission is to provide scientific and technical support to EU policies, interesting inventions are often created as a by-product of the JRC work programme, and the organisation actively encourages the licensing of these results.

Recently patented new technologies are diverse and range from mobile phone software helping consumers to moderate their environmental impact to a new system providing early warnings of tsunamis.

www.jrc.ec.europa.eu/technology_portfolio/

In Belgrade, the JRC will focus on food safety and quality, energy and health. This event is organised together with the Serbian Ministry of Science and Technological Development.

<http://ec.europa.eu/dgs/jrc/index.cfm?id=2470>



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50 years JRC in Ispra: Open Day
Ispra, Italy, 16 May 2009

The JRC site in Ispra celebrates its 50th anniversary with an Open Day on 16 May 2009. After the highly successful Open Day in 2007 with almost 8,000 participants, this year's edition promises to be bigger and better than ever. Registration for the event will open in April and will be accessible via the Open Day website.

To mark the Open Day, the JRC has launched a competition for school children in Italy. The 214 entries from schools all across the country, which included drawings, songs, video clips, newspapers, toys and board-games, have made it a great

success. The winners of the competition will be invited to the Open Day to receive their prizes.



The day's programme will include more visits to interesting laboratories with interactive experiments as well as lively presentations, shows and entertainment for all age groups. Again, a special programme with scientific games and quizzes will be prepared for children.

<http://www.jrc.ec.europa.eu/ispra-openday2009>



Open Day 2007: visitors' crowd at the main entrance of the Ispra site

Can creativity be measured?
Brussels, Belgium, 28 – 29 May

The main question for the conference, organised by the JRC Institute for the Protection and Security of the Citizen (IPSC), is: can we measure creativity?

The conference will feature presentations of initiatives from the European Commission on measuring different aspects related to creativity. In addition, it will bring high level experts to explore measures of creativity at two different levels: societal and individual.

At the societal level, there has been an increasing amount of literature in different disciplines proposing different set of indicators to measure different aspects of creativity and innovation. At the individual level, creativity research in the last 50 years has developed different tools for the measurement of the construct.



The conference, which takes place in the frame of the European Year of Creativity and Innovation, should contribute to the exploration of possible ways of measuring creativity and the factors that enhance it.

<http://ipsc.jrc.ec.europa.eu/event.php?event=126>

OTHER NEWS

Intensified cooperation with the Republic of Korea

A cooperation agreement between the JRC Institute for Reference Materials and Measurements (IRMM) and the Korea Research Institute of Standards and Science (KRISS) signed on 2 March aims to advance measurement science and foster greater confidence in the comparability of international measurements.

Areas covered by the agreement

range from bio-analysis (DNA measurements) and radionuclide metrology (environmental measurements), to food control and



mechanical testing, for example of the toughness of steel.

JRC-IRMM and KRISS will work together to facilitate greater international understanding and acceptance of metrology and standardisation.

http://ec.europa.eu/dgs/jrc/index.cfm?id=1410&obj_id=7140&dt_code=NWS

New nursery at JRC Ispra

The JRC opened a nursery (crèche) in a new building at its site in Ispra in March. The new facility has been designed to meet the special needs of children and provides space for 90 children aged from six months to four years who will soon enjoy the airy and bright atmosphere of the 1,300 m² crèche.

Along with the already existing European School in Varese and the 'Garderie' (a day care after-school centre for the 4-11 year old children), the new nursery contributes to a family-friendly environment which, moreover, is the aim of the European Commission's well-being policy. These facilities are also intended to improve working conditions at the Ispra site and to help attract

excellent scientists by making it one of the most attractive research campuses in Europe.

<http://www.jrc.ec.europa.eu/jobs>

Community Reference Laboratories newsletters

The first issues of newsletters from the Community Reference Laboratory (CRL) for Polycyclic Aromatic Hydrocarbons and the CRL for Mycotoxins have been published. These publications should improve the flow of information between members of the networks and inform about latest publications or upcoming conferences in respective research fields. The National Reference Laboratories are invited to contribute to forthcoming issues.

<http://irmm.jrc.ec.europa.eu/html/publications/newsletters/>



Opening of the new nursery building at the Ispra site

The JRC Newsletter is a 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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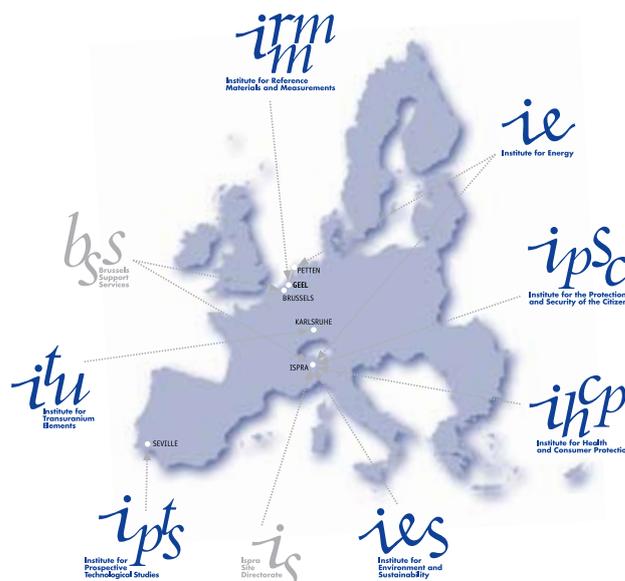
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Picture credits

p. 5: Antonio Sariñana (Walk)

p. 6: Jean Scheijen (Earmuff)



The mission of the JRC is to provide customer-driven scientific and technical support for the conception, development, implementation and monitoring of EU policies. As a service of the European Commission, the JRC functions as a reference centre of science and technology for the Union. Close to the policy-making process, it serves the common interest of the Member States, while being independent of special interests, whether private or national.