ICT-AGRI era-net Newsletter

Coordination of European Research within ICT and Robotics in Agriculture and related Environmental Issues

Issue 3, March 2010

What's inside

Editorial

Reading this newsletter, I hope you will agree with me, that ICT-AGRI has the potential for strengthening European ICT and robotic science and improving coorperation between European funders and researchers.

The first ICT-AGRI call will be launched 15 April 2010. The objective is to give researchers an opportunity to participate in transnational projects and sharing the knowledge and expertise in Europe. 14 countries have decided to participate in this first call.

Mapping the knowledge within ICT and robotics in Europe is a central aim of the ERA-NET. In doing this a Meta Knowledge Base will on 15 April be opened for the public on our website www.ict-agri.eu.

Another aim of ICT-AGRI is to formulate a Strategic Research Agenda. This will be done in cooperation with the stakeholders including the industry.
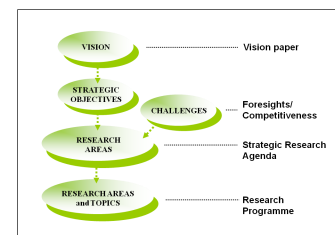
The European Commission has recently published their strategy 'EUROPE 2020. A European strategy for smart, sustainable and inclusive growth'. ICT-AGRI has a big challenge to respond to this new strategy.

Inside this ICT-AGRI Newsletter you will be able to learn more about the call, our progress on the mapping exercise, and what vision we may see in the ICT-AGRI strategic research agenda. I hope you will read this issue with interest!

Niels Gøtke, Coordinator

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Update from ICT-AGRI

ICT-AGRI Joint Call 2010: Integrated ICT and automation for sustainable agricultural production by Carina Madsen (DFIA, DK)

ICT-AGRI is launching its first joint call on 15 April 2010. Launching a transnational call will give researchers an opportunity to participate in transnational projects based on complementarities and sharing of expertise within ICT and robotics in the agricultural sector.

The aim of carrying out a transnational research call is to pool fragmented human and financial resources to improve both the efficiency and the effectiveness of Europe's research efforts.

The overall funding from participating countries are around € 2.5 Million, which researchers in 14 countries can apply for.

> **The pre-announcement for the first ICT-AGRI is now available:**
> **www.ict-agri.eu**

Call topics
Projects should apply a systems approach addressing farm level integration of information technology, communication technology, automation and robotics.

Researchers can apply for funding for projects that either take a:

- Broad approach by combining existing or new software and hardware products to demonstrate a system meeting important challenges within a specific application area, or
- Narrow approach focusing on specific elements of vital importance for the functioning of integrated systems

ICT applications may include farm management systems, information systems, monitoring systems, decision support systems, data and knowledge sharing

> **Important dates**
> - **Launch of call: Online submission open on 15 April 2010**
> - **Deadline for submission of pre-proposals is 31 May 2010**

systems, communication protocols, wireless communication, and human-machine coordination and standardisation activities.

Automation and robotics may include autonomous robots, bio-sensors, positional navigation, vision-based navigation, variable rate application, sensor-based process control, human-machine relations, and safety.

Who can apply
Project consortia must involve partners from at least three ICT-AGRI partner countries/regions.

Researchers from non-participating countries may be part of a consortia by funding their own participation. Industry can participate in projects and may be able receive funding depending on national regulations.

Applicants are encourage to contact their national contact points if they have questions in relation to national aspects. See also the next page on Meta Knowledge Base for how to find project partners.

Application process
The call is carried out as a 2-step application process. Pre-proposals will be evaluated for meeting national/regional priorities and policy needs.

Projects must have a clear added value of being carried out on a transnational level.

Projects should last between 12-24 months.

Successful candidates at the pre-proposal step will be invited to submit a full project proposal. The full project proposals be reviewed by an expert review panel.

More information will be posted on **www.ict-agri.eu** including the ICT-AGRI Pre-Announcement where contact details of national contact persons are listed.

The deadline for submitting pre-proposals is 31 May 2010.

Application Areas

Arable farming:
Environmental protection, food safety and quality, sustainable bio-energy production, CO_2 emissions, labour demands, chemicals reduction

Livestock farming:
Emissions of gas, dust and germs, environmental protection, animal welfare, disease monitoring, epidemics control, food safety and quality, labour demands

Water and soil management:
Irrigation optimisation, water saving, soil fertility maintenance, optimal fertilisation, environmental protection, drinking water protection, labour demands

Greenhouses:
Energy use, CO_2 emissions, labour demands, pesticide reduction

Orchards:
Irrigation and fertilisation optimisation, labour demands, food safety and quality

Post harvest:
Transport, storage, quality control, sorting, packing

Communication & Dissemination

ICT-AGRI Meta Knowledge Base & Internet 'Dating' for Researchers by Carina Madsen & Iver Thysen, DFIA(DK)

On 15 April 2010 a new section of the ICT-AGRI website, the ICT-AGRI Meta Knowledge Base will be launched.

The Meta Knowledge Base is designed to be a tool for finding project partners for the ICT-AGRI calls.

It will also be a place to obtain valuable information about the existing knowledge of ICT and robotics in the agricultural sector. The Meta Knowledge Base is available from the ICT-AGRI homepage at **www.ict-agri.eu**.

Knowledge mapping
Part of the objective of ICT-AGRI is to map current knowledge on ICT, robotics and automation in agriculture and agri-environment.

The mapped information is to be used for developing a strategic research agenda and identifying topics for future ICT-AGRI calls for projects.

Mapping existing knowledge within this heterogeneous research and development area is, however, not a simple task. A great deal of the important knowledge and information is not available through publications like scientific papers, conference proceeding, etc.

In contrary, much knowledge is embedded in products, software applications, online services, machines and equipment and various prototypes, without documentation targeted for sharing the knowledge.

A mapping based only on publically available sources is therefore not adequate.

Screen print of the soon to be launched Meta Knowledge Base of the ICT-AGRI website

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ICT-AGRI will as an alternative ask researchers and developers in this field to tell us about their knowledge via an interactive website.

Well aware of the reluctance that researchers and developers, when it comes to spending time on reporting without getting anything in return, the ICT-AGRI Meta Knowledge Base is from the beginning designed with a search engine making the contributions publically available in an efficient manner.

What is "Meta Knowledge"
The term "Meta Knowledge" means that the website is designed to hold descriptions of knowledge with links to the knowledge itself as online reference material of any kind.

The contributors are asked to provide, for each item of knowledge, a title and a very short abstract intended for a quick assessment in searches, and a longer text with more details intended for a more complete description.

In addition, each posting will be classified by a selection of keywords intended for use in searches. The items of knowledge can be research (concluded or ongoing), machines and equipment, robots, software, online services, standards or patents, incl. commercial products.

Internet 'dating' for researchers
Another important purpose of the ICT-AGRI Meta Knowledge Base is to assist researchers and developers to get in contact with fellow workers.

The website has facilities for profiles of individuals as well as organisations. All contributions to the website, profiles and knowledge postings, are "signed" with the contributor's email address, making contact easy.

The future value of the ICT-AGRI Meta Knowledge Base is depending on the interest in the research and development community to contribute with knowledge and profiles. ICT-AGRI will do the best to create a useful and user-friendly website for the benefits of its users.

Update from ICT-AGRI

First steps in the development of the Strategic Research Agenda and Programme by Renate Dörfler, BLE (DE)

Establishing a Strategic Research Agenda and Programme is an important step to bring European research in Information and Communication Technologies (ICT) and Robotics on the right track for a competitive, sustainable and environmentally friendly agriculture.

A Strategic Research Agenda (SRA) is a list of broad research areas to focus on. It aims at medium- and long term solutions filling out gaps in current knowledge and giving attention to un-addressed threats and challenges.

A Research Programme (RP) is a structured schedule of research topics and areas relevant for a particular call for research projects.

It responds to the research areas set up in the strategic research agenda.

A suggested Vision for ICT-AGRI
The initial point for the development of the SRA and RP is a vision for the future. The suggested Vision refers to the main targets of ICT-AGRI.

The suggested Vision (see text box) could potentially have a number of positive effects on the society and stakeholders.

Advanced steering technology

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Impact on society
- Supplying healthy, uncontaminated food
- Reducing environmental deterioration
- Decreasing climate change and its effects
- Maintaining biodiversity
- Empowering rural areas

Impact on farmers and the agricultural engineering sector
- Boosting competitiveness of farms and the agricultural engineering sector
- Reducing human workload and manual labour
- Increasing customer oriented machines and processes
- Enhancing environmental protection activities
- Strengthening animal welfare
- Rising application of sophisticated information and management systems
- Increasing farm vehicle power from renewable sources

Strategic Objectives
Vital concepts are required to make the Vision a reality. First step is the formulation of clear Strategic Objectives.

A suggestion for an ICT-AGRI Vision

- The European agriculture is knowledge-based, competitive, sustainable and environmentally friendly.
- The agricultural sector is accompanied by a innovative, world-wide competitive and customer focused agricultural engineering sector having a positive impact on European economy.
- Agricultural technologies are driven by renewable energies and contribute to mitigating climate change.
- Agriculture is accompanied by a knowledge-based agricultural ICT sector providing solutions for the management of complex future farming systems.

Update from ICT-AGRI

The Strategic Objectives focus on currently most pressing issues in the development of innovative technologies applied to biological systems. Issues such as the enormous complexity and expenditure for R&D, the fragmentation of research, the partly lacking user-friendliness and the rather low consumer and public acceptance when technology deals with food.

Strategic Research Agenda

In further steps work package 4 will develop the SRA and RP for ICT-AGRI. The SRA is a means for achieving the Strategic Objectives and the Vision.

Future challenges for the agricultural section will be raised by foresight studies (e.g. climate change, food security, diminishing resources of fossil fuels and growing world population) and by striving for farm competitiveness will be taken into consideration in the development of the SRA.

Relevant research areas will be selected in a forthcoming workshop by defining research needs meeting these challenges.

Research Programme

The future areas of research and research topics will be presented in the research programme which will be the basis of future calls.

Stakeholders from various areas including researchers, administrative
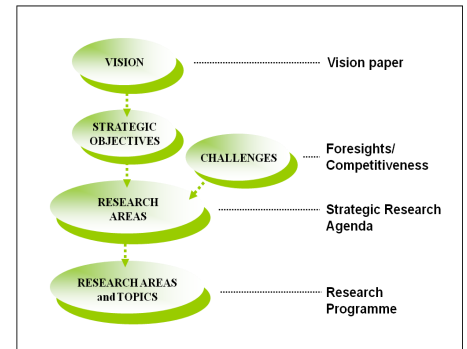
Steps of the development of the Strategic

bodies, farmers, and industry will be involved in this process.

The SRA and RP will coordinate R&D and facilitate new research both in the private and public sector for the benefit of the farmer.

Stakeholder Meeting in Belgium: Technology Workshop by Jürgen Vangeyte, EV-ILVO (BE)

Reducing the gap between farmers and technology was the challenge of a recent workshop "Technology: an added value for your farm. Embedded system in precision agriculture" organised by DSP Valley, the Institute for Agricultural and Fisheries Research (EV-ILVO) and the Boerenbond.

The main goal of the workshop was to create synergy between farmers and technology enterprises.

From one side, farmers are confronted with different challenges that needs to be solved to make their tasks easier and more efficient. Nevertheless, farmers have no idea which technologies are available to help them face these challenges.

On the other side, technology enterprises are capable of developing new technologies, but are not aware of the real challenges encountered by an agricultural entrepreneurs and farmers.

During the workshop different stakeholders learned more about each other's situation and challenges. From consultations like this synergies and new collaborations can bring new projects and solutions.

Participants of the workshop learned about GPS technology, visions technology and the reliability of electronics. In three parallel sessions more specific areas were dealt with.

In the diary session, farmers and technicians discussed about the use of robotics, RFID technology and new sensors for milk quality.

In a second session on precision agriculture, high precision GPS for ploughing, wireless sensors and camera techniques for automatic detection of weed were presented.

Plant activity sensors, led-lighting and energy saving were the three main topics of the greenhouse session.

In a concluding plenary session all participants were convinced that to get new technology integrated in the daily farming practice it should be designed in close cooperation with end users. Initiatives bringing the farmers' concerns to the attention of researchers and engineers are highly encouraged.

This workshop was a successful step in this progress, and also within the framework of ICT-AGRI the work with bridging the stakeholder gaps will continue.

Article

MANUFUTURE European Technology Platform by Jens Ferhmann (ManuFuture, DE)

European **agricultural engineering and technology** is of **worldwide importance to food production** and to meeting the foreseeable increase in world demand that will result from population growth and increasing incomes in developing countries.

In the agricultural machinery industry alone, without considering animal production technologies, 250 000 people are employed in the EU 25 countries in 4 500 businesses.

The **challenge for the industry is to develop and implement systems that produce high quality and safe food, feed and energy** while also being efficient, and sustainable.

Traditional agriculture is changing and the industry now has to walk a tightrope between providing equipment that allows the farming and food production industries to be competitive, and respecting new trends in conservation, sustainability and alternative energy sources.

Since there is a strong connection to other production and manufacturing technologies, the **agricultural engineering and technologies** (AET) **community has formed a Working Group under the umbrella of the European Technology Platform MANUFUTURE**.

AET aims at maintaining European leadership through targeting the decision makers at EU level so that the Seventh Research Framework Programme call topics reflect the needs of the industry, providing a platform that initiates collaborative RTD activities in the sector.

Stakeholders construct together the strategic vision that identifies research fields, and they have defined a roadmap of RTD topics under the umbrella of a European Technology Platform.

The **Strategic Research Agenda** has identified key research area such as **automation and robotics including inter-vehicle communication** and **in-vehicle networks; sustainable supply systems for renewable energy for**

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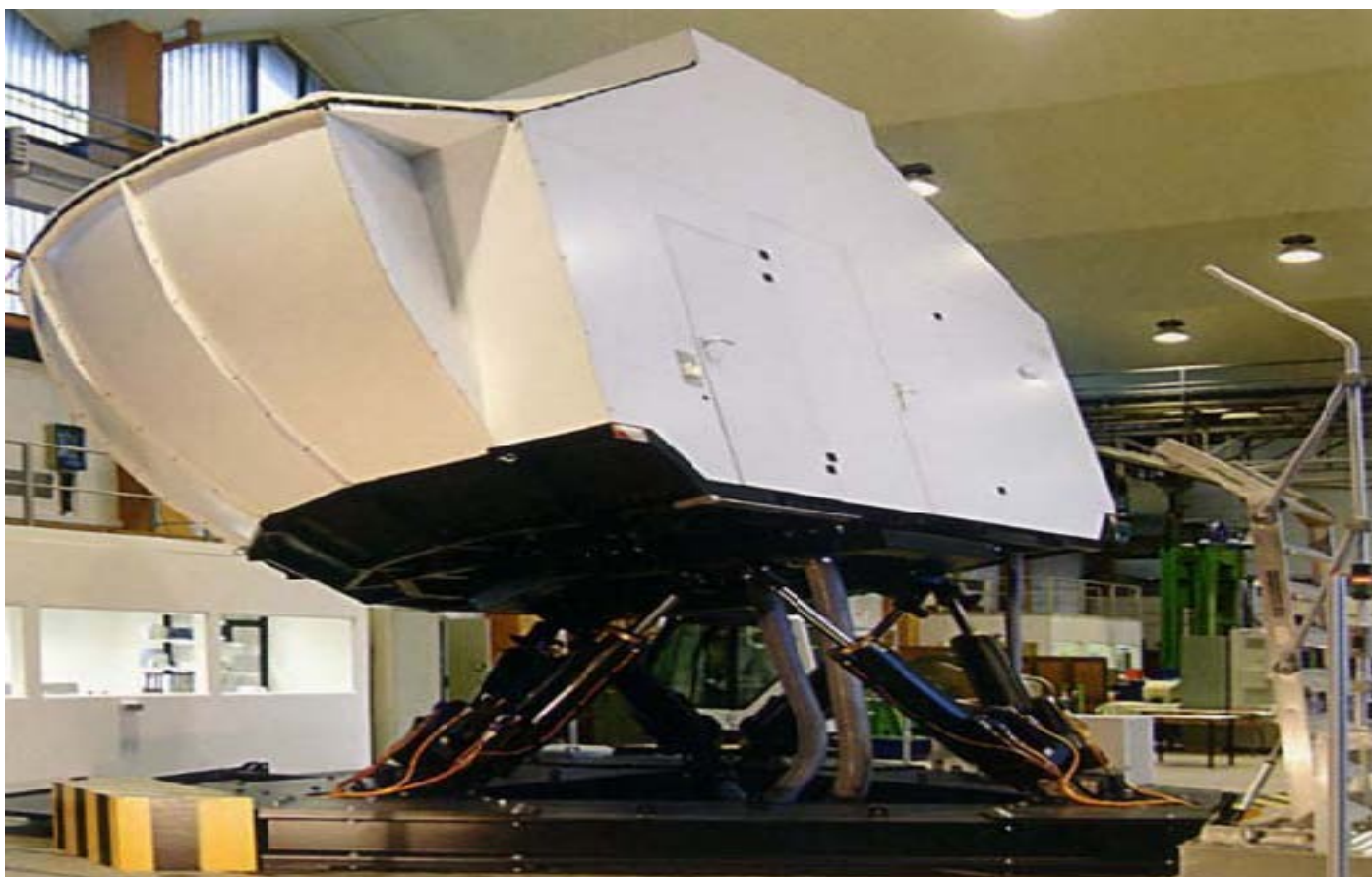
Simulator for the integration of cabins, developed for agricultural and construction machines

Article

mobile machinery; innovative safety and driving systems; and biomass logistics.

The industry needs to develop integrated or holistic technologies such as precision farming techniques, where sensors are used to take measurements such as crop yields, soil quality and moisture levels and where a central management system controls the versatile processes.

High level automated machines and robots are also being developed to carry out routine farming tasks such as milking and shepherding.

The future of agriculture will depend on sophisticated machinery and a high level of electronic communication to ensure farms produce food cost-efficiently and with no impact to the environment.

AET's vision is that equipment and machinery far beyond state of the art will help "farms of the future" to run their own businesses efficiently. Electronics, automation and robotics will be widely used.

Wireless communication technologies will offer access to widely spread farming facilities and link them to decentralised web-based processing and information sources.

Renewable energy sources such as bio-based synthetic fuel, hydrogen and fuel cells will be made available on a large scale.

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Simulation of working environment for tractor cabine development, development of human machine interfactes (HMI)

Furthermore, new power train systems will include decentralised electric drives and tractors, and self-propelled farm machinery will be fully automated.

Automatic data gathering for documentation purposes and for improved farm management will be a fundamental component in all farm equipment technologies.

Both, ICT-AGRI, which has a more political orientation and AET, which is more industry driven, are able to address all stakeholders and interesting parties in the field of automation and robotics of agricultural machinery, can help to overcome european fragmentation in research activities on those fields and a close collaboration will contribute to an improved international coordination of national research activities.

The definition of future research needs could be based on the already existing Strategic Research Agenda of the AET and should end up in a common paper to research and developments in the area of information and communication technologies in agricultural engineering.

A close collaboration of both networks will be a valuable contribution for a more strategic and better structured research and development landscape in an essential field of agricultural engineering and technologies.

The European Technology Platforms (ETPs) are open to all stakeholders, both organisations and individuals. A full list of Manufuture's members is available from the website: www.manufuture.org

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The ICT-AGRI Secretariat is situated at the Danish Food Industry Agency, Ministry of Food, Agriculture and Fisheries in Copenhagen, Denmark.

The secretariat has the overall responsibility and day-to-day management of the project.
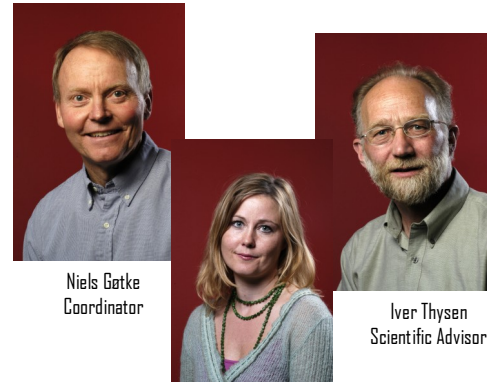
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Scientific Advisor

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ICT-AGRI Partners & Observers

There are 18 partners and 14 observer organisation involved in the ICT-AGRI ERA-NET covering 21 countries.

Partners

1. Ministry of Food, Agriculture and Fisheries, Danish Food Industry Agency (DFIA), Denmark
2. Ministry of the Environment, Danish Environmental Protection Agency (DEPA), Denmark
3. Ministry of Agriculture of the Flemish Community, Institute for Agricultural and Fisheries Research (EV-ILVO), Belgium
4. Ministry of Agriculture and Forestry (MMM), Finland
5. CEMAGREF Technical Centres Development (CEMAGREF), France
6. Federal Agency for Agriculture and Food (BLE), Germany
7. Federal Ministry of Food, Agriculture and Consumer Protection (BLEV), Germany
8. Greek Research and Technology Network (GRNET), Greece
9. Ministry of Agriculture and Rural Development (MARD), Israel
10. Ministry of Agriculture, Food and Forestry Policies (MiPAAF), Italy
11. Latvian Academy of Sciences (LAS), Latvia
12. Malta Council for Science and Technology (MCST), Malta
13. Swiss Federal Office for Agriculture (FOAG), Switzerland
14. Ministry of Agriculture and Rural Affairs, General Directorate of Agricultural Research (GDAR), Turkey
15. Scientific and Technological Research Council of Turkey (TÜBITAK), Turkey
16. Netherlands Organisation for Applied Scientific Research (TNO), Netherlands
17. Agriculture and Food Development Authority (TEAGASC), Ireland
18. Region of Murcia Agency of Development (INFO Murcia), Spain

Observers

1. Leibniz-Institute for Agricultural Engineering Potsdam-Bornim (ATB), Germany
2. National Institute for Agricultural Research (INRA DARESE), France
3. Food and Agricultural Organization of the United Nations (FAO), Italy
4. Region of Lombardia (ROL), Italy
5. Cities on Internet Association (COIA), Poland
6. Romanian Academy of Agricultural and Forestry Sciences (ASA), Romania
7. Soil Science and Conservation Research Institute (SSCRI), Slovakia
8. Instituto Technologico Agrario de Castilla Y Leon (ITACYL), Spain
9. LEITAT Technological Center (LEITAT), Spain
10. Swedish Institute of Agricultural and Enviornmental Engineering (JTI), Sweden
11. Federal Department for Economic Affairs (DEA), Switzerland
12. Department for Environment, Food and Rural Affairs (DEFRA), United Kingdom
13. Agricultural Research Institute, (ARI) Cyprus
14. Wageningen University (WUR), The Netherlands

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- ICT-AGRI Joint Call 2010
- KBBE ERA-NET Platform
- Verification of Environmental Technologies for Agricultural Production—VERA
- Meeting reports