Project Information

CELTIC Telecommunication Solutions

Wireless World Initiative New Radio +

Mobile communications is an important economic driver generating growth. The support of broadband services for mobile and wireless applications towards International Mobile Telecommunications-Advanced (IMT-Advanced) is a key trend for future radio access technologies, providing deployment scenarios with reduced operator's CAPEX and OPEX. The WINNER+ project addresses these challenges from a technical, standardisation and regulatory perspective. It will contribute essential technical information to CEPT and ITU-R via well-established channels to support the external evaluation process of IMT-Advanced.

Main focus

Mobile communications is an important economic driver generating growth. Significantly improved transmission capabilities are increasingly required to support the growing traffic originating from content-rich data services in order to connect people as well as machines to the information society. The support of broadband services for mobile and wireless applications towards IMT-Advanced is a key trend for future radio access technologies.

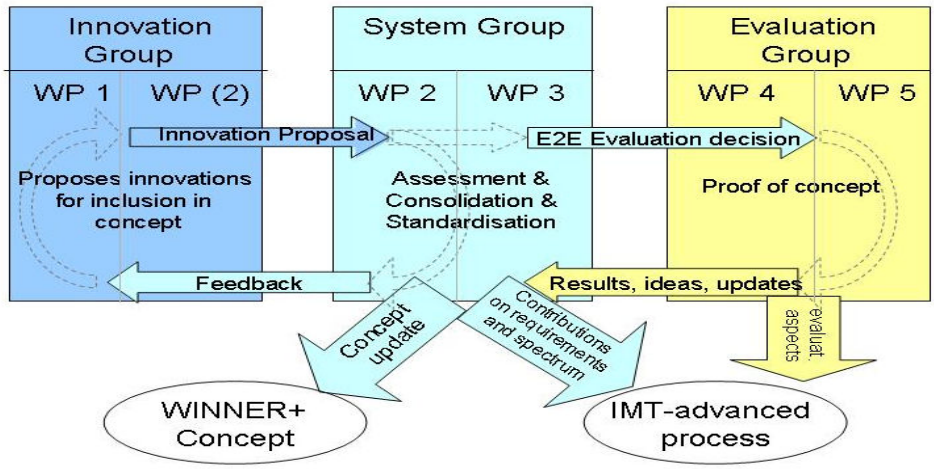
The WINNER+ project will develop, optimise, and evaluate the IMT-Advanced compliant technologies building on the research results of the EU FP6 projects WINNER and WINNER II and the current status of discussion in ITU-R. Evaluations will take place mainly by software simulation. In addition, a demonstrator will be developed to illustrate key new functionalities. In addition, WINNER+ registered as External Evaluation Group at ITU-R. The objectives of the project can be summarised as follows:

- Research, integration and evaluation of innovations in areas with high potential of exploitation in IMT-Advanced.
- Contribution to standards organizations of technology elements suitable to IMT-Advanced.
- Strong contribution to ITU-R and participation in the evaluation of the selected technology proposals.
- Demonstration of the selected key technologies developed in the project.

The following diagram shows the interaction of the different work packages and the work flow Approach:

Considerable effort is needed to improve and optimise the various interrelations of innovative concepts with the functions of the complete WINNER+ system and to ensure the potential performance gains under these constraints to support the IMT-Advanced requirements. The different concepts and technology solutions will be evaluated by means of simulations, which take into account the requirements of ITU-R for IMT-Advanced. The research, simulation and related standardisation activities will be accompanied by the validation of key technologies, which will help to promote the concept and contribute to the overall proof-of-concept.

The Innovation Group consists of Work Package 1 (WP1), which will develop innovative ideas on the selected focus ar-



WINNER+

Project ID: CP5-026

Start Date: 1 April 2008

Closure date: 30 June 2010

Partners:

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Alcatel-Lucent Telecom Limited, UK
Bundesnetzagentur, Germany
Chalmers University, Sweden
CEA-Leti, France
DOCOMO Communications Laboratories Europe GmbH, Germany
Elektrobit Corporation, Finland
Ericsson AB, Sweden
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Project Websites

www.celtic-initiative.org/projects/winner+/
http://projects.celtic-initiative.org/winner+/

eas and propose them in the System Group. It works on innovative ideas in the area of advanced radio resource management, spectrum technologies, peer-to-peer techniques and network coding, and advanced multiple antenna systems.

The System Group maintains and develops the system concept and provides the overall framework, strategy, and coordination. The system-concept-related work is done by the System Concept Design Work Package (WP2). The work is based on the integration and consolidation of technology components obtained from the Innovation Work Package (WP1), and the associated performance assessment results obtained from the performance assessment Work Package (WP4).

The Evaluation Group provides proof-of-concept and evaluation of the WINNER+ system concept by computer simulations, key performance figures analysis and hardware demonstration of selected key technologies. The Performance Assessment Work Package (WP4) carries out all the major system level performance assessment campaigns in the project, including the evaluations towards ITU-R. This Work Package carries out the required simulator (or analytical assessment tool) development in collaboration with the Innovation Work Package (WP1) and System Concept Design Work Package (WP2).

The Trials Work Package (WP5) carries out activities to validate some key functions in hardware. These activities are based on focused hardware development of key WINNER+ technologies.

The IMT-Advanced and Spectrum Work Package (WP3) works on the IMT-Advanced issues related both to new spectrum bands (after WRC-07) and the IMT-Advanced process. This Work Package is responsible that the WINNER+ project views are presented in the proper regulatory forums, both in CEPT and in ITU-R.

Main results

The main advancement of WINNER+ beyond the state-of-the-art will be an IMT-Advanced qualified system concept, including the latest advancements of radio and radio network technologies. The LTE standard and the results of WINNER II will be used as a starting point, the latter already including capabilities that go beyond state-of-the art radio access technology standards, e.g. relaying capabilities and increased carrier bandwidth up to 100 MHz. In addition, a complete and consistent system concept with well understood inter-dependencies between different functions will be developed. Finally, proof-of-concept evaluations will be carried out on system level and on the individual technical features, in order to ensure a competitive IMT-Advanced concept proposal.

Innovations are expected in the following areas of the WINNER+ project: radio-resource management, spectrum sharing and its flexible usage, device to device (peer-to-peer) communications and network coding, and advanced multiple antennas systems, including coordinated multipoint systems. These activities will take into account the ITU-R requirements and standardisation targets for IMT-Advanced and the results of WRC-07 that was held in 2007.

Impact

The ITU-R process is an important activity for the worldwide development and consensus building of the new IMT-Advanced radio system(s). The timeframe for the WINNER+ project from early 2008 to mid 2010 fits perfectly to the ITU-R schedule for IMT-Advanced. The key candidate technology proposals to ITU-R are expected to be prepared and submitted via Standards Development Organisations (SDOs), and it is expected that 3GPP and IEEE (and 3GPP2) will play an important role in this process.

This process provides a unique opportunity for the WINNER+ project to contribute technical concepts suitable to the preparation of candidate proposals in 3GPP and possibly also in IEEE (and 3GPP2) towards ITU-R and to participate actively in the ITU-R evaluation process. The WINNER+ project will contribute essential technical information to CEPT and ITU-R via well-established channels, significantly increasing the opportunities to exploit the WINNER+ system concept. In November 2008 WINNER+ registered as External Evaluation Group of technology proposals to IMT-Advanced radio systems at ITU-R. This allows the WINNER+ project to ensure that the competencies of the European telecommunications industry are fully exploited in the IMT-Advanced process. This is meant to give maximum benefits to the industry when the systems will be commercialized.

The consortium is composed of major players in the telecommunications industry, who are also active in respective standardisation bodies. Thus, the consortium is in an excellent position to facilitate consensus building in an early stage and to ease thereby the standardisation process towards a potentially more harmonised solution compared to 3G. These activities may help to overcome the incompatibilities between the different evolution paths to systems with the interim LTE-like capabilities.

About Celtic

Celtic is a European research and development programme, designed to strengthen Europe's competitiveness in telecommunications through short and medium term collaborative R&D projects. Celtic is currently the only European R&D programme fully dedicated to end-to-end telecommunication solutions.

Timeframe: 8 years, from 2004 to 2011

Clusterbudget: in the range of 1 billion euro, shared between governments and private participants

Participants: small, medium and large companies from telecommunications industry, universities, research institutes, and local authorities from all 35 Eureka countries.

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