

The way forward towards IMT* -Advanced

with Framework Programme 7

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*IMT: International Mobile Telecommunications



Contents

- Future Mobile Communication Systems
- FP6 Project Portfolio
- Activities in FP7

FP: Framework Programme



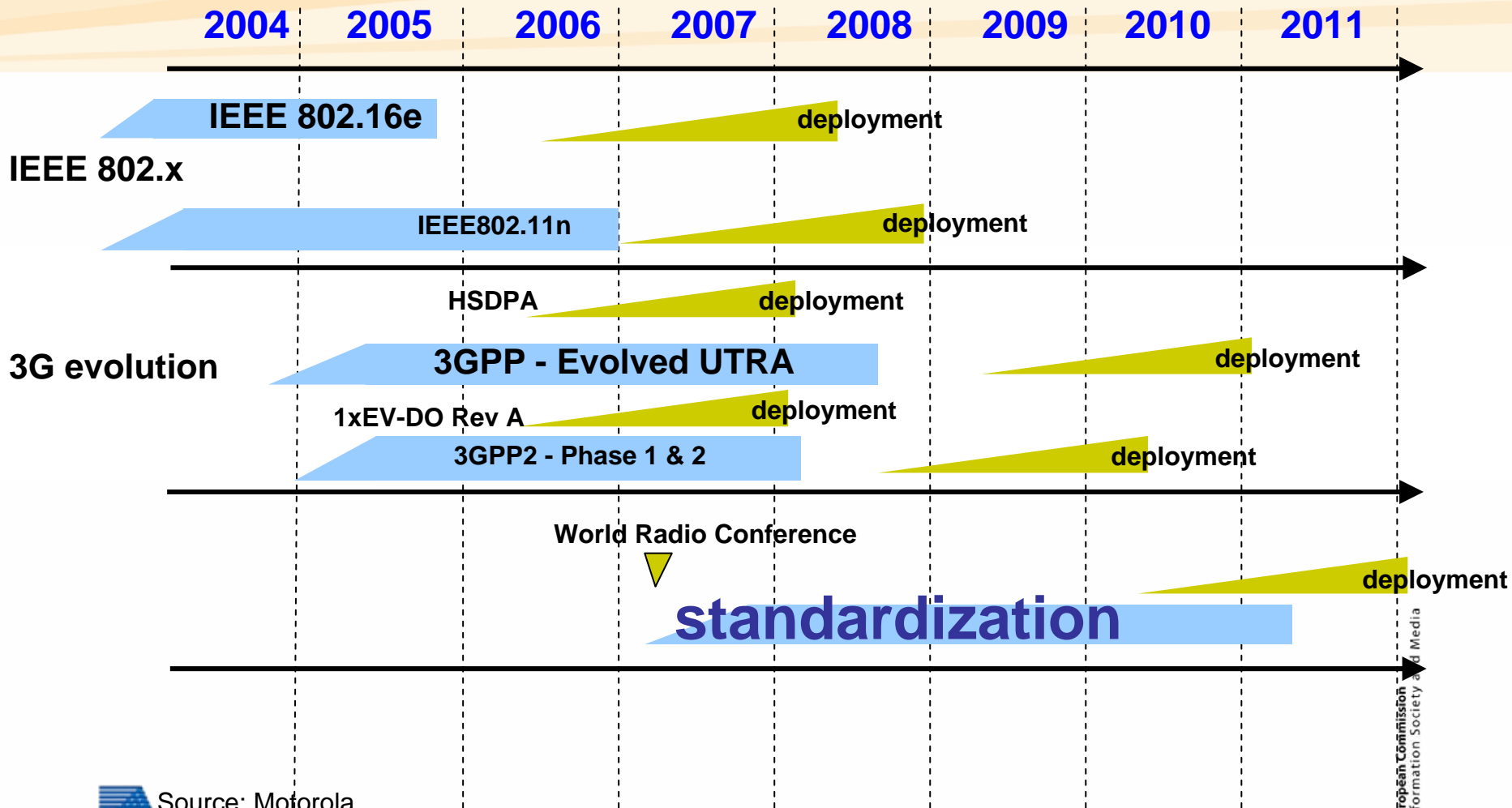
Dr.-Ing. Rainer Zimmermann – December 2007



Requirements for Ubiquitous Mobile Broadband

- **True broadband:** no user-perceived difference from fixed and mobile broadband access
- **Enhanced resource efficiency:** spectrum-efficiency, versatile/reconfigurable, cost-efficiency (CAPEX and OPEX)
- **Increased service capabilities:** *context-aware* applications
- **Full fixed-mobile convergence:** equivalent service capability across a fixed or mobile access
- **Service portability:** operation across multiple networks/service provider domains

Standardisation Roadmaps



Source: Motorola



Research - Multiple Wireless Futures

- **Next-generation wireless LAN** – emerging radio technologies (802.11n, MIMO), improved MAC layer protocols, multicasting, hybrid cellular/WLAN, security
- **Ad-hoc mesh networks** – use of different radio technologies, spectrum coordination, self-organization, scalable/secure routing protocols, cross-layer, QoS support
- **Cognitive radio networks** – interference avoidance methods, networks with multiple radio PHY's, forming adaptive networks, discovery protocols, cross-layer routing
- **Sensor networks** – power efficient protocols, hierarchical topologies, data aggregation and information flows, content-aware routing, service API's, real-world applications
- **Pervasive networks** – heterogeneous radio technologies, integration of sensors with WLAN/cellular, dynamic binding protocols, closed loop control applications...
- **Future cellular networks** – alternative radio technologies (WiMax, 4G), open interface for new network and transport protocols, new services (location-aware, media, etc.)



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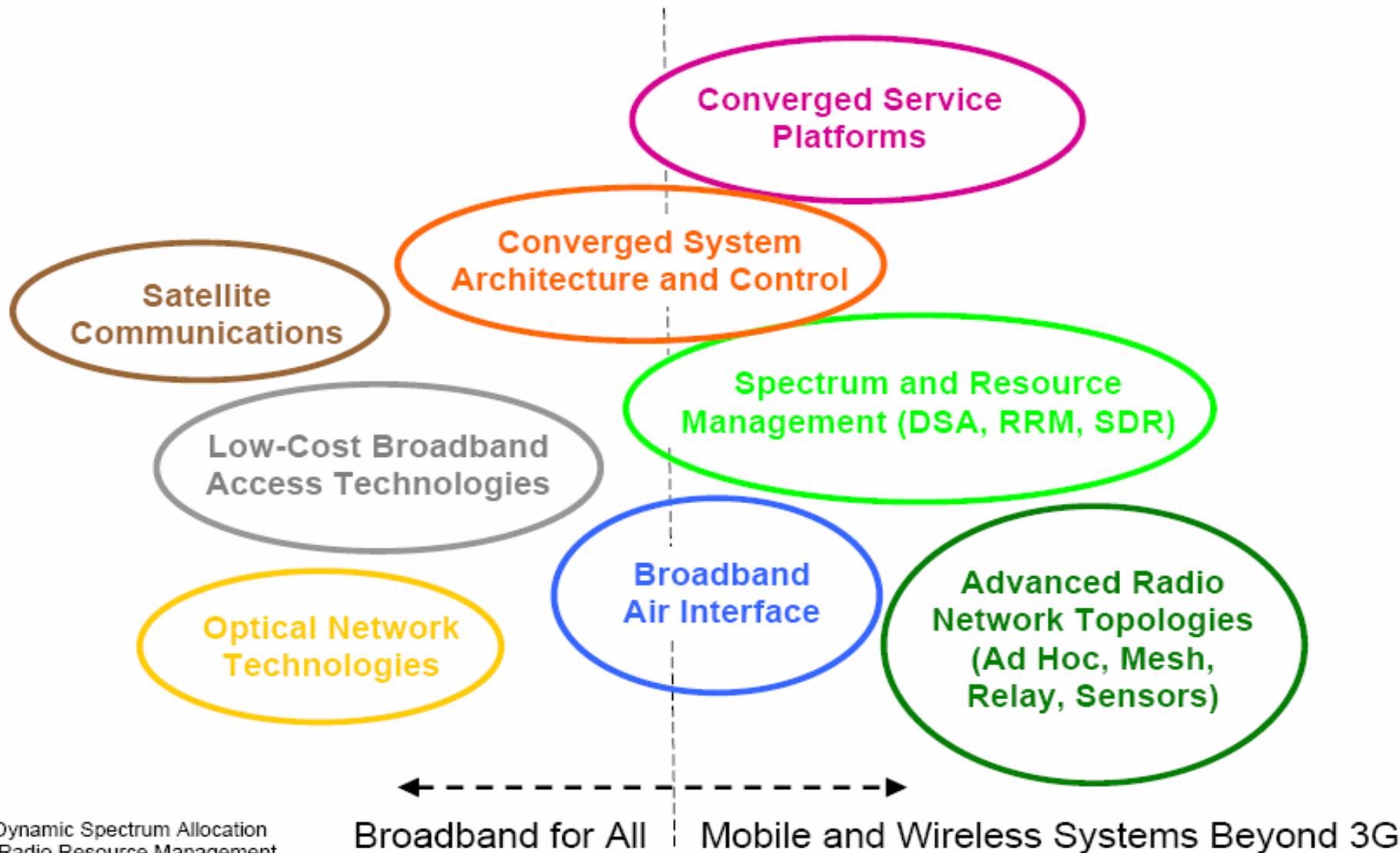
ICT: Information and Communication Technologies
FP: Framework Programme



FP6 Activities: Mobile and Wireless Systems beyond 3G

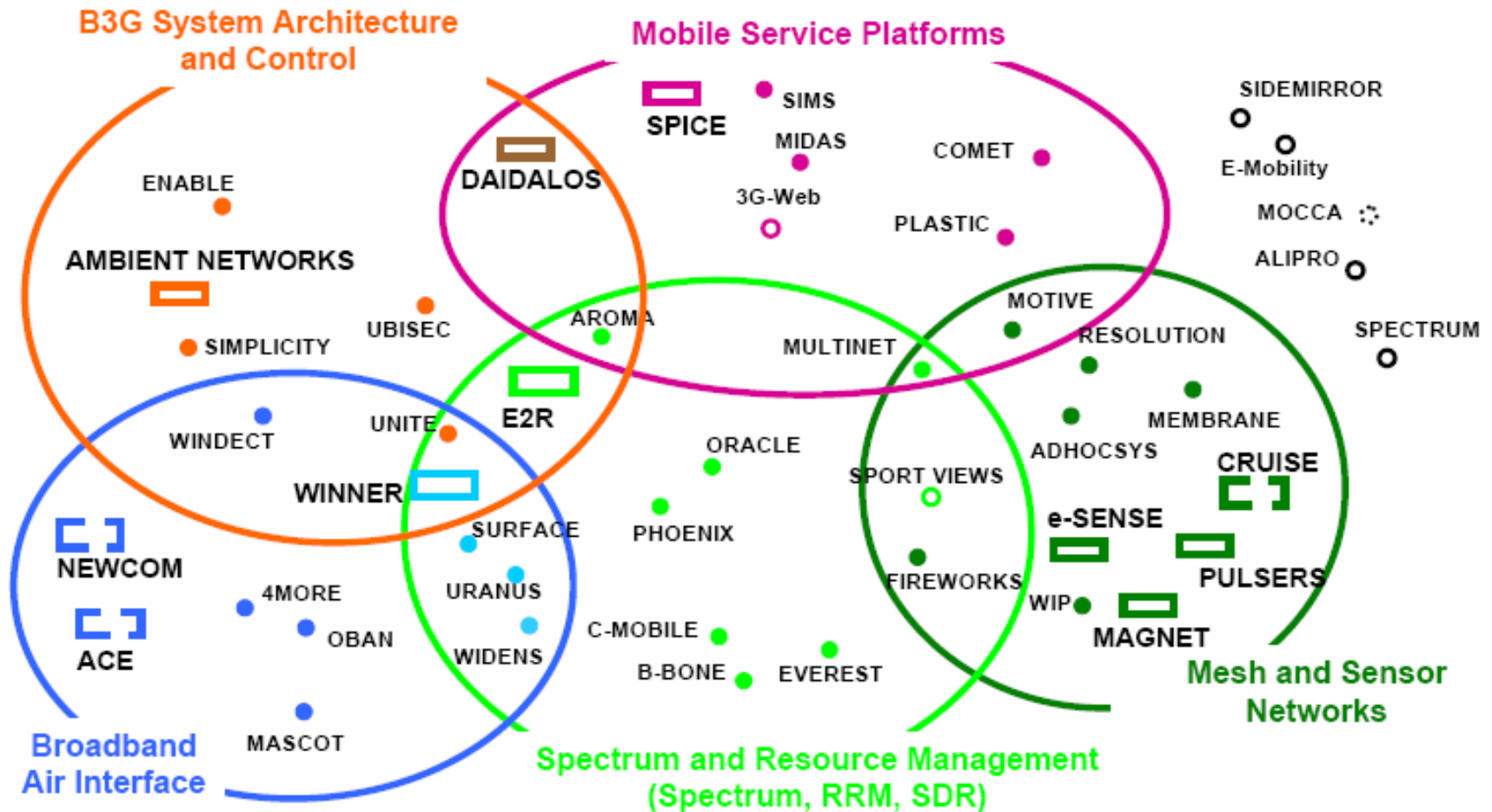
- Ensure technology leadership for the **next-generation mobile broadband air interface**
 - after the world-dominating European standards GSM and UMTS
- **Develop “Ambient Networks”**
 - By integrating local, cellular and broadcast access networks,
 - Developing new architectures for Sensors, Personal and short range networks
- Enable the **take-up of UMTS** services on the European market
 - UMTS+ : providing higher-speed data and better spectrum-efficiency technologies
 - enabling service providers to create innovative and interoperable mobile services and multimedia content for the user

FP6 Clusters Mobile and Broadband



DSA: Dynamic Spectrum Allocation
RRM: Radio Resource Management
SDR: Software Defined Radio

Project Portfolio - Mobile



Instruments :

Integrated Project (IP)

Network of Excellence (NoE)

● Specific Targeted Research Project (STREP)

○ Specific Support Action (SSA)

⊛ Coordination Action (CA)

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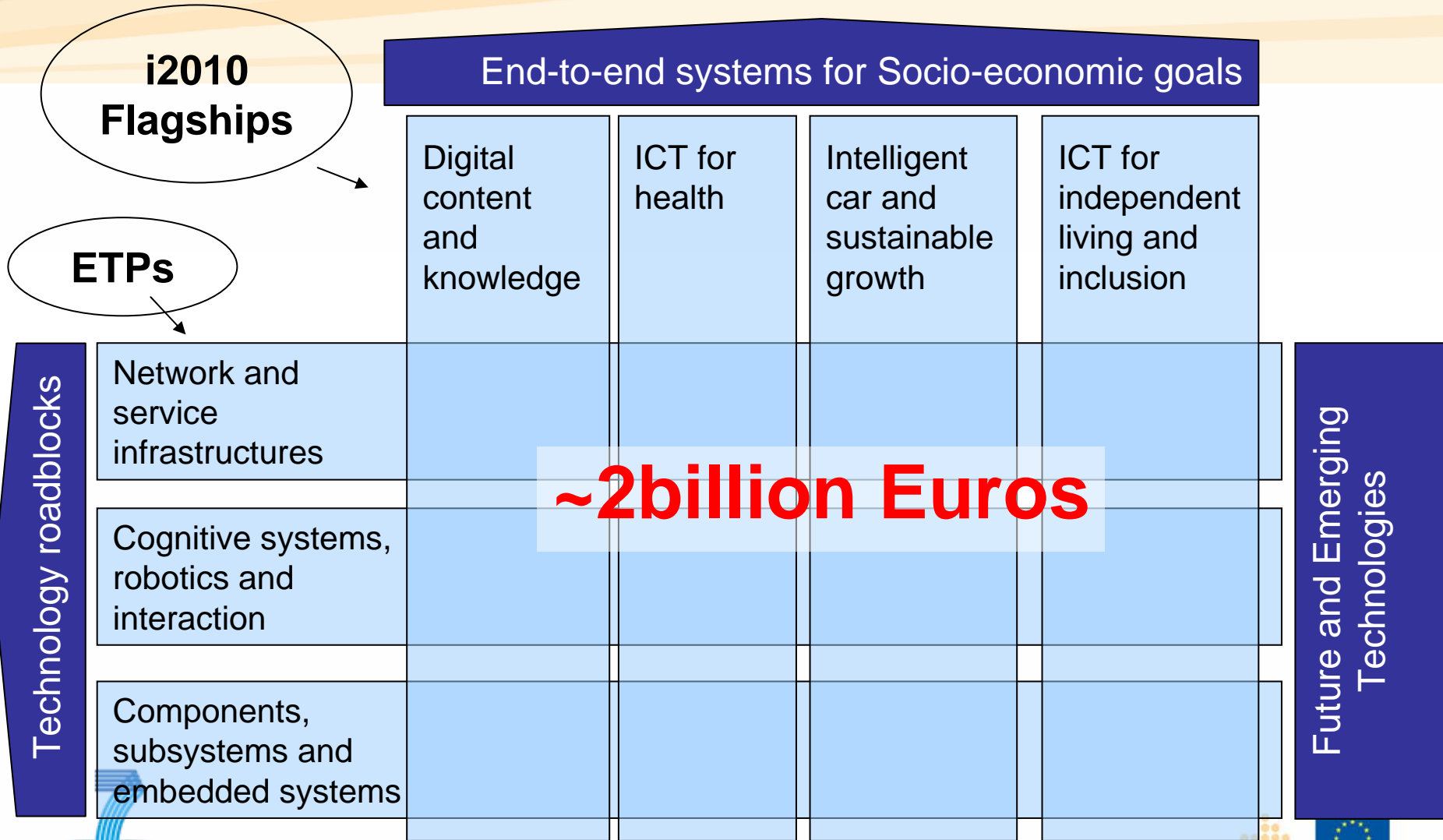
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7th Framework Programme (2007-2013)

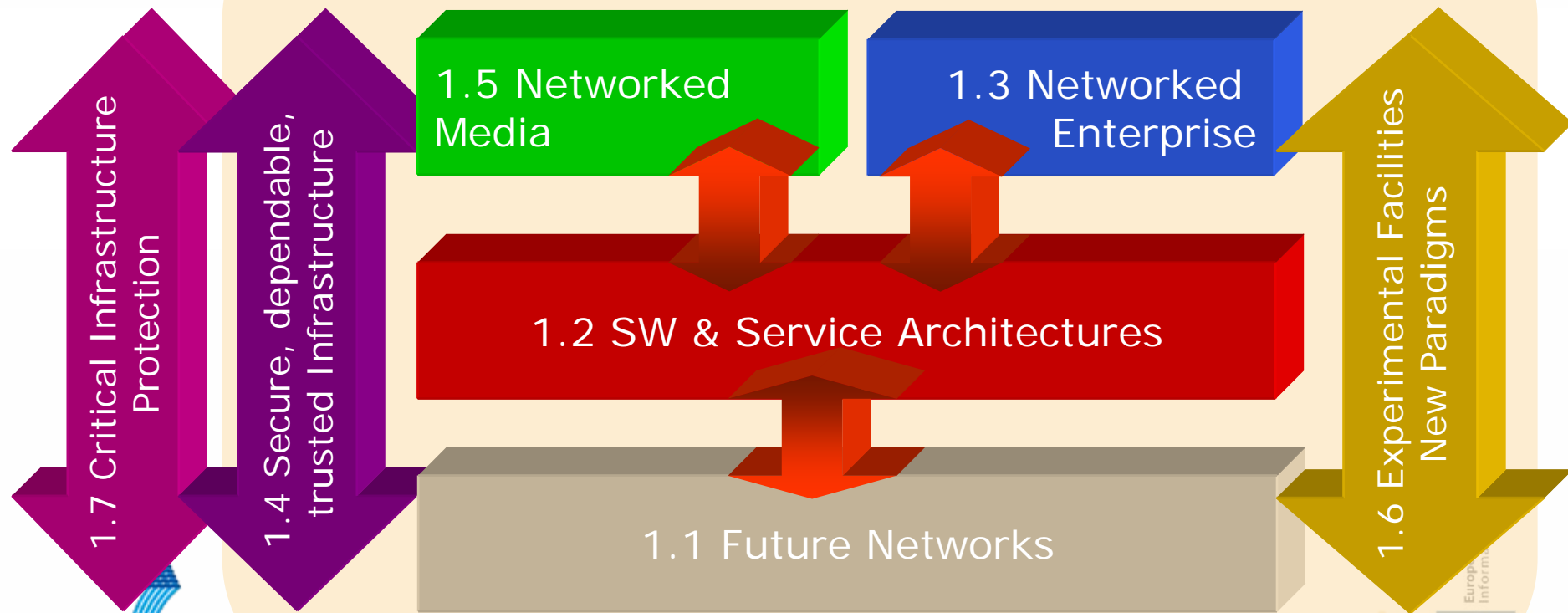
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|-------|-------------|---------------------------|----------------------------------|----------------------------|--------------------|--------------------|----------------------------|---------------------------------------|--------|------------------------------------|-----------|--|--|
| €32 B | COOPERATION | 10. Space | 9. Security | 8. Socio-economic Research | 7. Transport | 6. Environment | 5. Energy | 4. Nano, Materials, Production Techn. | 3. ICT | 2. Food, Agriculture Biotechnology | 1. Health | | |
| | | European Research Council | | | | | | | | | | | |
| | | Marie Curie Actions | | | | | | | | | | | |
| | | Research Infrastructures | Research for the benefit of SMEs | Regions of Knowledge | Research Potential | Science in Society | International Co-operation | | | | | | |
| | | CAPACITIES | | | | | | | | | | | |
| | | PEOPLE | | | | | | | | | | | |
| | | IDEAS | | | | | | | | | | | |
| | | €7.5 B | | | | | | | | | | | |
| | | €4.7 B | | | | | | | | | | | |
| | | €4.2 B | | | | | | | | | | | |

ICT Work Programme 2007-2008



Challenge 1 – Pervasive and trusted Network and Service Infrastructures

The Future Internet



The Network of the Future

- Background

- The Challenge is to deliver the next generation of ubiquitous and converged network and service infrastructures for communication, computing and media.
- From “Mobile and Wireless Systems” and “Broadband for All” in FP6, to a converged Objective 1.1 “The Network of the Future”

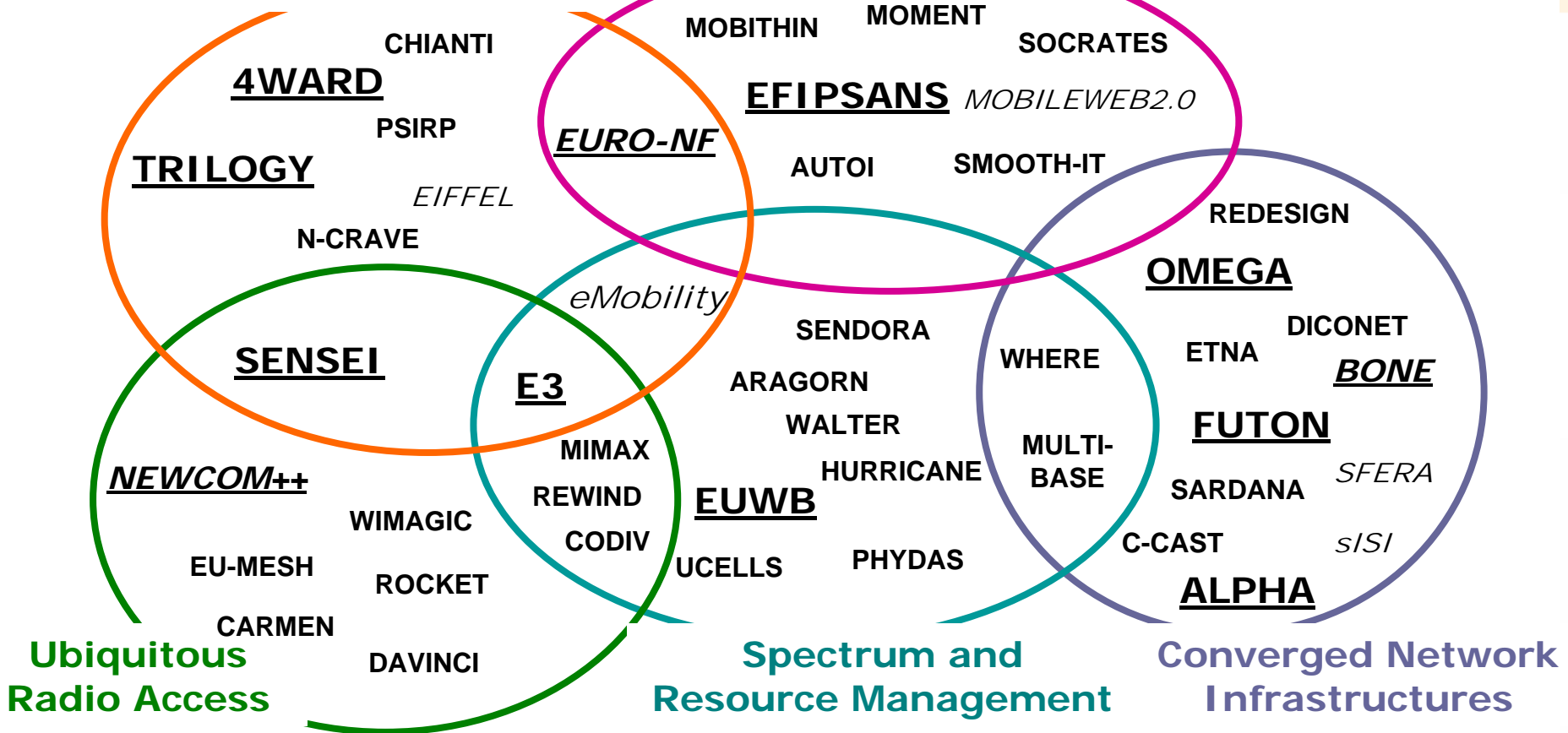
- Main Drivers and Objectives

- Ubiquitous network infrastructures and architectures
- Convergence of mobile, fixed telecom and Internet network infrastructures
- Optimised control, management and flexibility of the future network infrastructure
- Towards mobile broadband and efficient/dynamic spectrum usage
- Technologies and system architectures for the Future Internet

Project Portfolio - Network of the Future

Future Internet Architecture and Protocols

Future Internet Management and Operation



INTEGRATED PROJECT (IP)

NETWORK OF EXCELLENCE (NoE)

SPECIFIC TARGETED RESEARCH PROJECT (STREP)

Coordination and Support Action (CSA)

EC instruments for Coordination

Technology Platforms

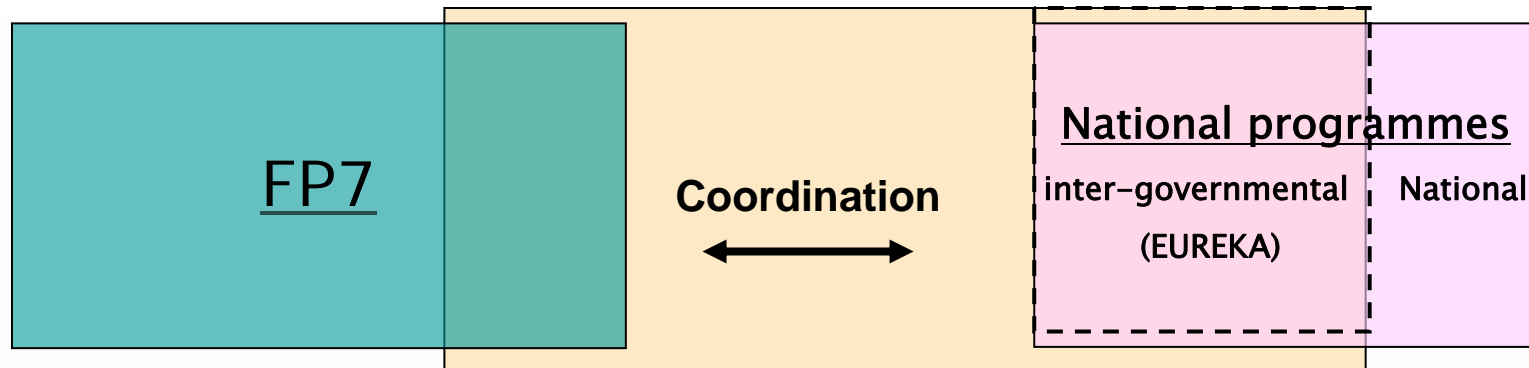
e-mobility

NEM

ERA-NET

Common Pan-European Strat. Research Agenda

Overall coordination and policy alignment in European Research Area



Joint Technology Initiative JTI

Conclusions

Way forward in WP 2009-2010

- Topic areas that are less covered, which should be emphasized in the next WP:
 - Wide Area mobile broadband access
 - High-speed core networks (including optical)
 - Network Management and Operation including Cognitive and Autonomic Technologies
- A number of IP proposals failed because of too generalised technical goals and lack of demonstrated commitment
- Commission should review mechanisms to efficiently provide efficient administration and dissemination of Technology Platforms.

More Information

- FP7 web site with **ICT WP 2007/2008 for download**
<http://cordis.europa.eu/fp7/ict>
- The ICT Future Networks web site
http://cordis.europa.eu/fp7/ict/future-networks/home_en.html
- Our bi-monthly newsletter:
 - Distributed via email (by subscription - free of charge);
 - Contains info on all activities in the field including calls for proposals, conferences, publications, etc.)