STRONGEST outline

Future Networks 5th FP7 Concertation meeting

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STRONGEST

European Commission
Information Society and Media

FUTURE NETWORKS

SEVENTH FRAMEWORK PROGRAMME

Outlook

- Rationale for launching the project
- Main tangible objectives of the project
- Structure of the Project
- Expected impact

Main current networks bottlenecks

- **Bandwidth demand keeps heavily growing**, due to the evolution of applications, a growing user base and additional emerging network-based applications (e.g. triple-play with ultra-high definition video, 3D Internet, Tele-Medicine,…). Requirements on the **quality of the connections** are growing as well and often **faster than network deployments can cope with**
- **Costs of networks** are still too high to cope with the huge increase of bandwidth, both in terms of both **investments** and **operational expenditures**
- Current network architectures are strongly based on electronics and not optimized from **power consumption** point of view
- Today's network architecture has a **limited scalability** with respect to the growing amount of traffic and the numbers of terminals and functions, and **limited flexibility of bandwidth management** to deal with dynamic traffic profiles
- Present networks do not guarantee **end-to-end quality of service** (from service platforms to end-user terminals)

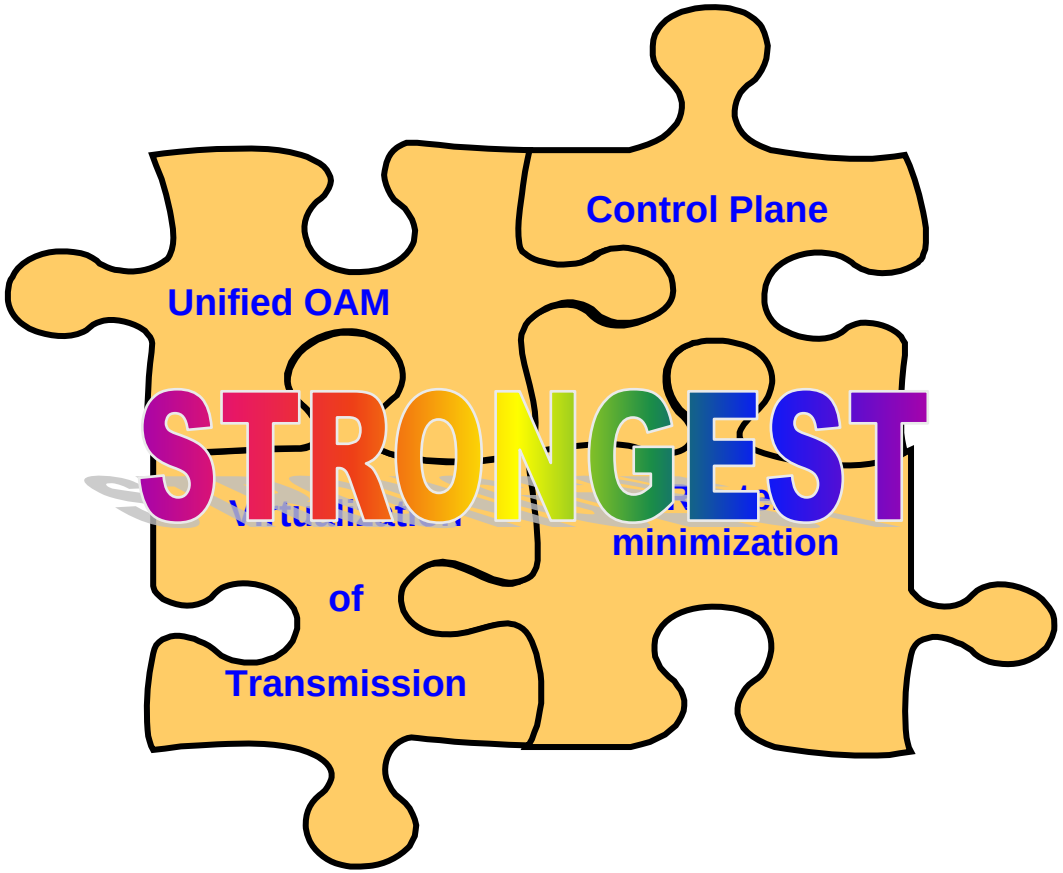
Main bottlenecks and … their solutions

Limited scalability

Limited flexibility

Lack of hard QoS

Excessive TCO



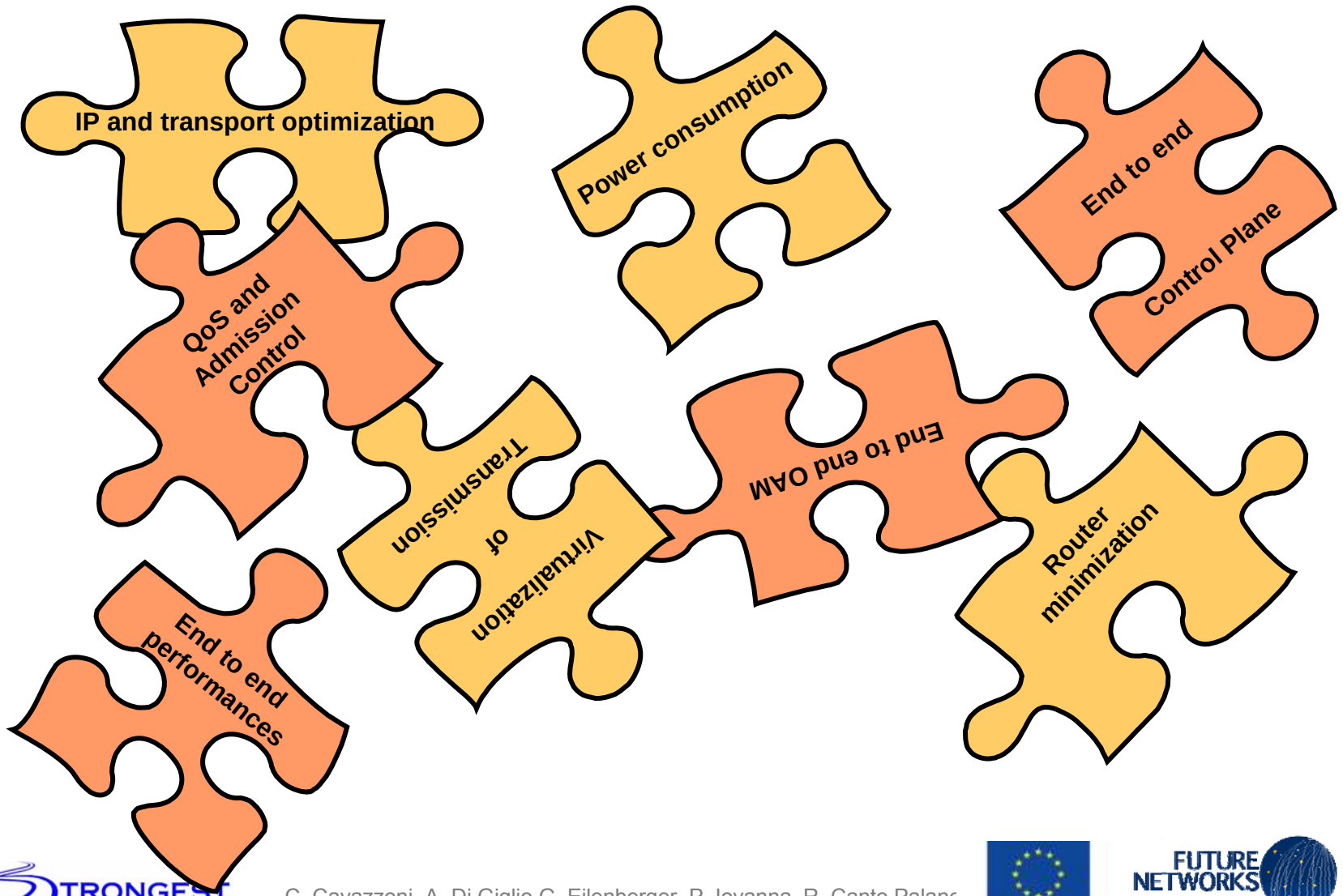
Main Objective

- STRONGEST's main objective is to design and demonstrate an evolutionary ultra-high capacity multilayer transport network, compatible with Gbit/s access rates, based on optimized integration of Optical and Packet nodes, and equipped with a multi-domain, multi-technology control plane. This network will offer:
- High scalability and flexibility
- Guaranteed end-to-end performance and survivability
- Reduced total cost of ownership
- Minimize the power consumption across the entire network

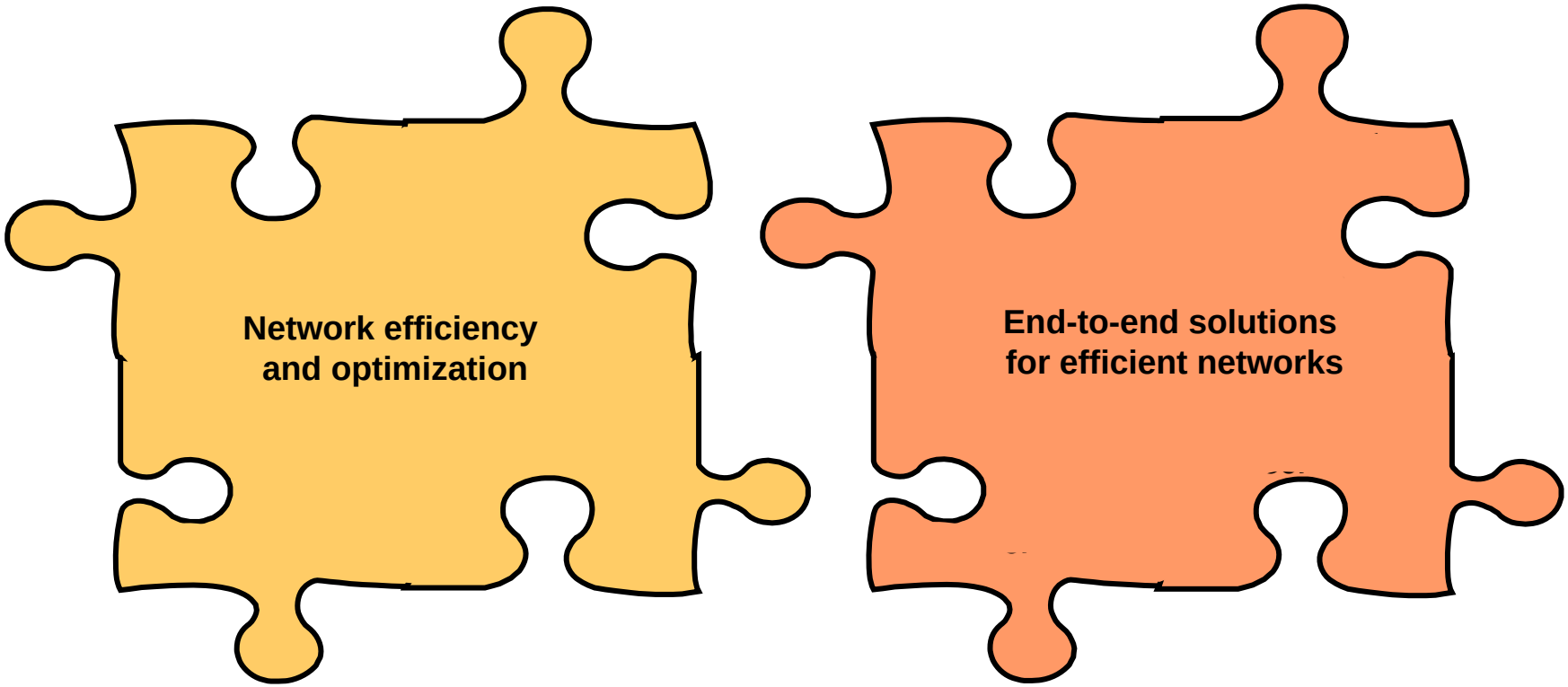
Detailed objectives

- To analyse the feasibility of the proposed architectures by means of performance and techno-economic impact studies, aiming at network performance and cost optimization.
- To identify the best solutions to reduce the energy consumption of the telecommunication network. Efficient combinations of optical and electrical components will be investigated.
- To research, develop, analyze and experimentally validate the optimum combination of L1 (Optical) and L2 (Packet Transport, OBS,…) transport technologies.
- To pursue end-to-end services delivery crossing domains that are heterogeneous in terms of technologies (circuit transport networks and connection-oriented packet transport networks), control plane models (e.g. multi-layer/multi-region), OAM mechanisms, vendors and operators.
- To enable the virtualisation of resources, allowing the cooperation among heterogeneous data-plane technologies; this will permit quick and low-cost introduction of new services independent of the underlying transport platform.
- To experimentally validate the investigated network architectures, forwarding concepts and control mechanisms in an experimental implementation; therefore, quantitative technical laboratory investigations will be carried out.
- To contribute to the development of new European and global interoperable standards for multi-layer and multi-domain data and control plane, thus reinforcing the European position in standardization bodies and fora. The proposed new control and management mechanisms will be presented to the relevant working groups in IETF, IEEE802, OIF and ITU-T, ETSI standardization organizations.
- To foster the scientific exchange and collaboration between other scientific projects and organizations such as IST FEDERICA, BONE, AKARI (Japanease research Project) and GENI (American research Program).
- To educate European key staff including research managers and industrial executives.

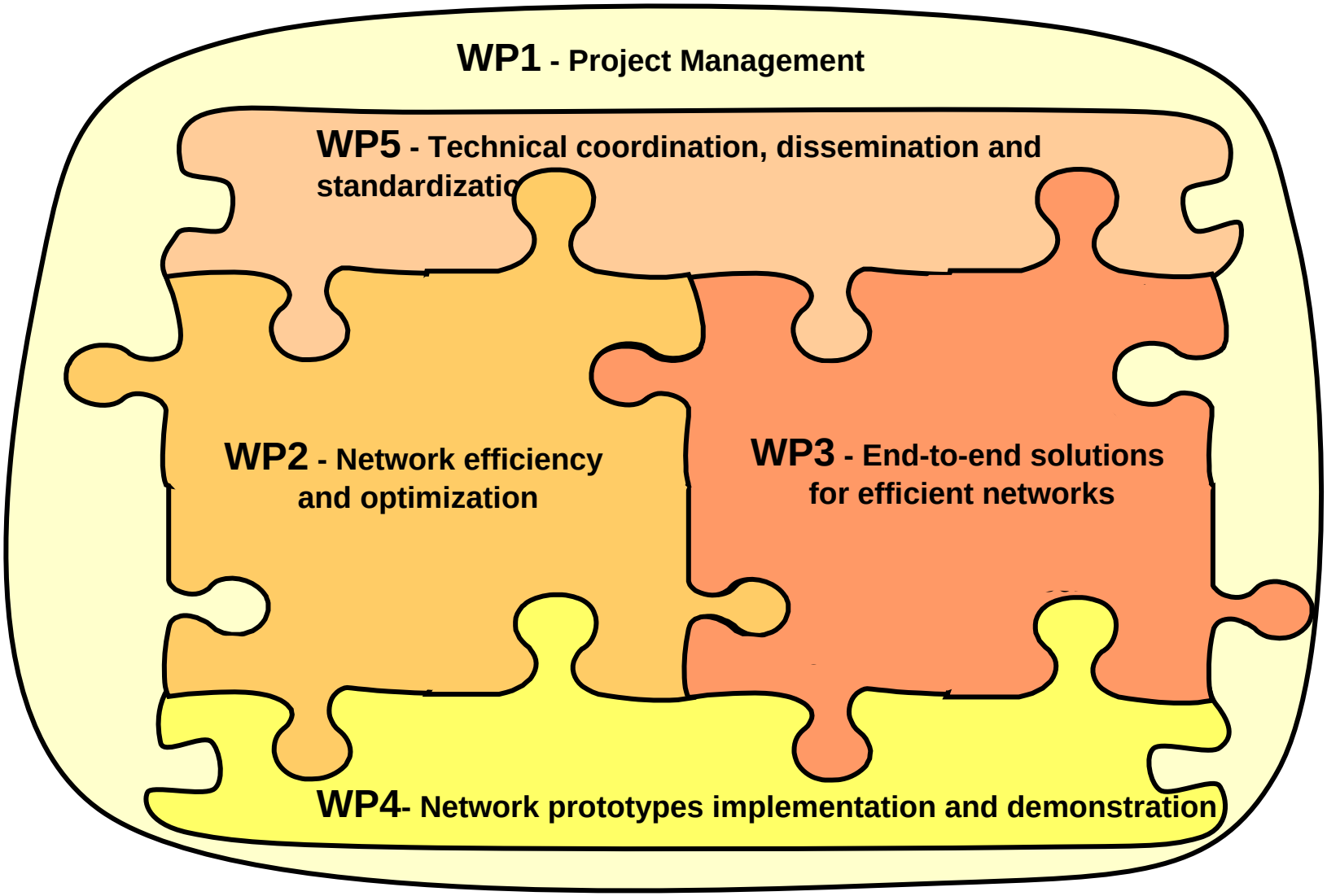
How to realize



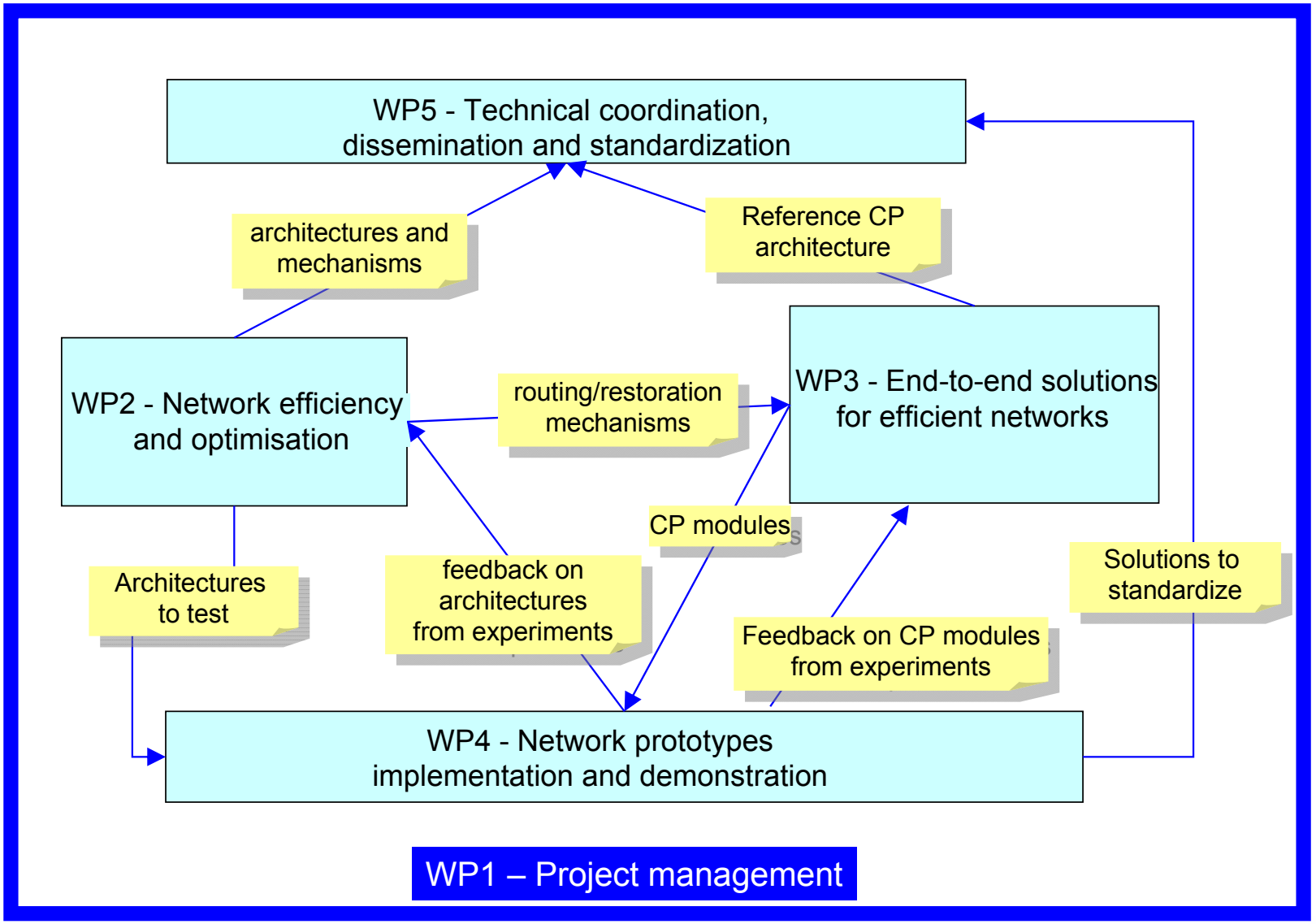
How to realize



How to realize



Project Structure and relationships



STRONGEST at a Glance

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Coordination of the Project

PROJECT COORDINATION

TELECOM ITALIA

WP COORDINATION

TELECOM ITALIA

ERICSSON
TAKING YOU FORWARD

Alcatel·Lucent

Telefónica

KEY ROLES

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Architecture chief
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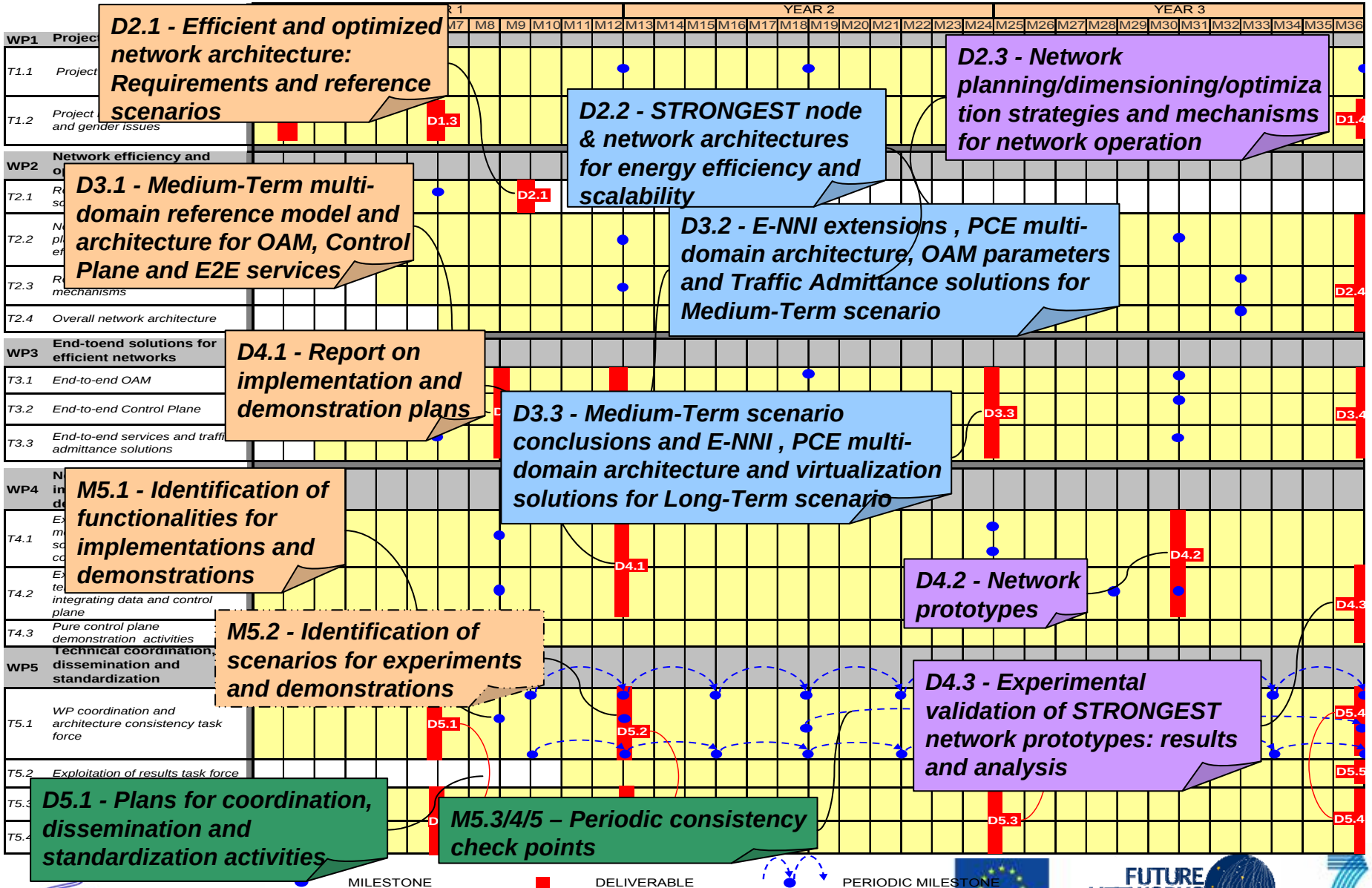
Overall planning



Role of testbeds

L2/WSON testbed

Location: CTTC , Barcelona (Spain)

Purpose: Experimental analysis of:

- Multilayer routing, restoration and grooming mechanism designed in T2.3 for PCE based GMPLS control plane .
- WSON and multilayer PCE based architectures designed in WP3 (scalability, speed, reconfigurability)

Evolutionary Scenario: Mid Term

Pure photonic sub-lambda granular testbed

Location: UoEssex , Colchester (UK)

Purpose: Experimental analysis of:

- Sublambda granular optical nodes designed in T2.2
- Routing, restoration and grooming mechanisms designed in T2.3 for sub-lambda granular optical networks.
- Long-mid Term interworking (UoEssex-BT)

Ultra High Capacity testbed

Location: ALU , Stuttgart (Germany)

Purpose: Experimental analysis of:

- Scalable hybrid photonic/electronic network architectures for Petabit transport networks designed in WP2

Evolutionary Scenario: Long Term

Pan European control plane testbed

Location: Multiple testbeds (TID, TI, BT, NSN, ALU, CTTC and UoEssex) interconnected by IP tunnels

Purpose: Experimental analysis of:

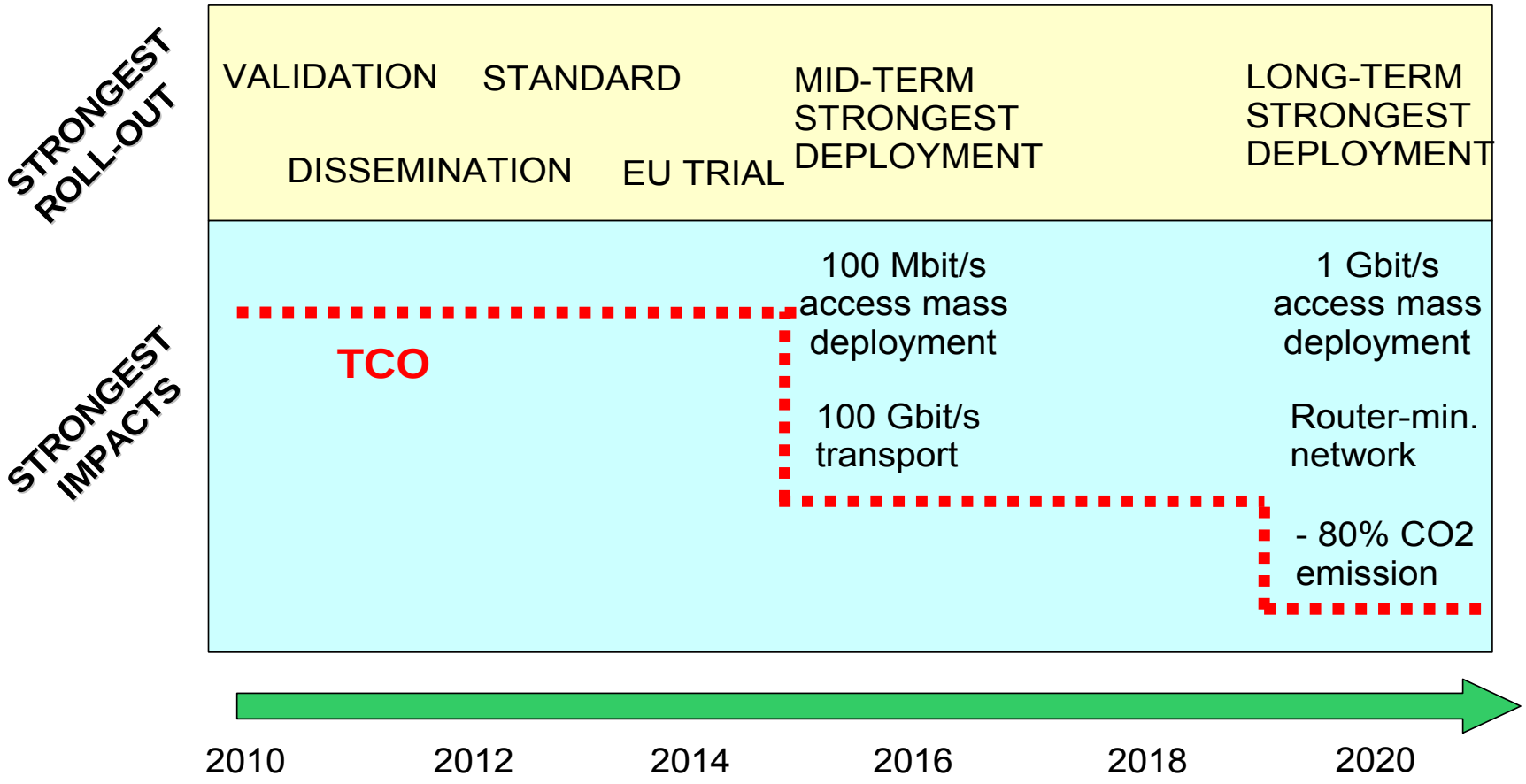
- Multidomain PCE based control plane architectures designed in WP3
- Control Plane interoperability tests
- CAC and PCE interworking
- E2e OAM interoperability tests

Evolutionary Scenario: Both Mid and Long Term

Expected impact

- Strengthen the position of European industry in the field of Future Internet technologies and reinforced European leadership in optical networks technologies;
- Increase the economic efficiency of access/transport infrastructures (cost/bit);
- Facilitate the creation of Global standards, interoperability and European IPRs reflecting federated and coherent roadmaps;
- Create wider market opportunities from new classes of applications taking advantage of convergence;
- Accelerate the uptake of the next generation of network and service infrastructures.

Improvement in exploitation of results and in IPR handling



Thank you