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EU H2020 „Advanced 5G Network Infrastructure for the Future Internet – 5G PPP"

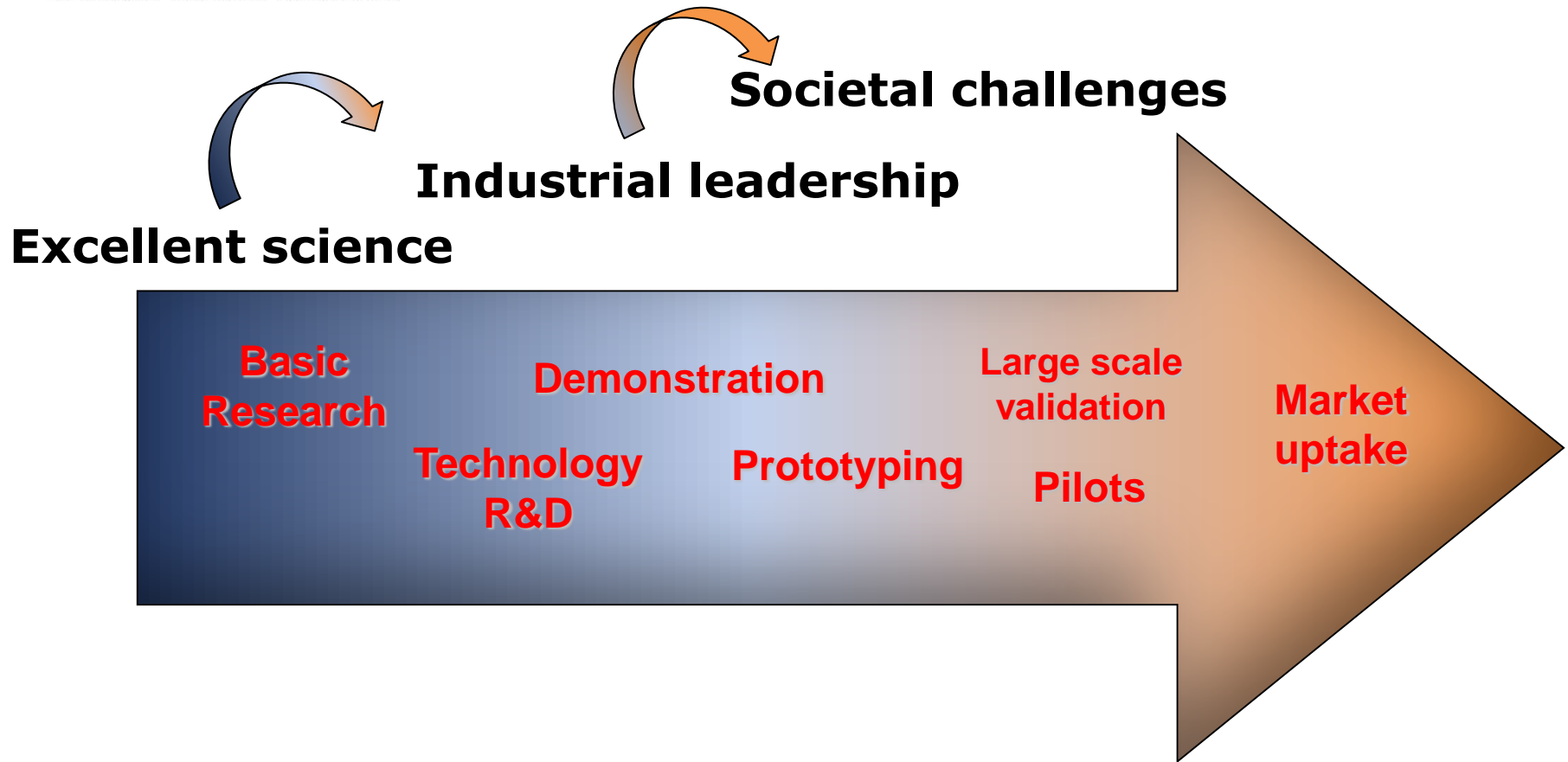## Németh Vilmos

H2020 ICT Információs Nap

Budapest, 2015. február 20.

H2020 és az innovációs lánc

Societal challenges

Industrial leadership

Excellent science

Basic Research

Technology R&D

Demonstration

Prototyping

Large scale validation

Pilots

Market uptake

ICT a H2020-ban

Europe 2020 priorities

Shared objectives and principles

Tackling Societal Challenges
- ICT
- ICT
- ICT
- ICT
- ICT
- ICT

- Health, demographic change and wellbeing
- Food security, sustainable agriculture and the bio-based economy
- Secure, clean and efficient energy
- Smart, green and integrated transport
- Climate action, resource efficiency and raw materials
- Inclusive, innovative and reflective societies
- Secure Societies

Creating Industrial Leadership and Competitive Frameworks
- Leadership in enabling and industrial technologies
  - ICT
  - Nanotech., Materials, Manuf. and Processing
  - Biotechnology
  - Space
- Access to risk finance
- Innovation in SMEs

ICT

EIT
JRC

Excellence in the Science Base
- Frontier research (ERC)
- Future and Emerging Technologies (FET)
- Skills and career development (Marie Curie)
- Research infrastructures

ICT

ICT

Simplified access

Dissemination & knowledge tranfer

Common rules, toolkit of funding schemes

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Future Internet a 2014-15. évi ICT LEIT Munkaprogramban

Támogatás: 395.5 MEuro

IoT

ICT 30: Internet of things and platforms for connected smart objects

Net Innovation
- **ICT 10:** Collective awareness platforms for sustainability and social innovation
- **ICT 13:** Web entrepreneurship

Software, services and cloud computing
- **ICT 7:** Advanced cloud infrastructures and services
- **ICT 8:** Boosting public sector productivity and innovation
- **ICT 9:** Tools and methods for software development

Experimental Platforms
- **ICT 10:** FIRE+ (Future Internet Research & Experimentation)
- **ICT 12:** More experimentation for the Future Internet

Network technologies
- **ICT 5**: Smart networks & novel Internet architectures
- **ICT 6**: Smart optical & wireless network technologies

Network technologies
- **ICT 14:** PPP on advanced 5G network infrastructure for the Future Internet

INCO

EU-Brazil R&D cooperation in advanced cyber infrastructure

EU-Japan R&D cooperation in Net Futures

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Public Private Partnerships (1)

Article 19 - Public-private partnerships

Horizon 2020 may be implemented through public-private partnerships where all the partners concerned commit to support the development and implementation of research and innovation activities of strategic importance to the Union's competitiveness and industrial leadership or to address specific societal challenges.

Goals:

- To solve problems together with industry

- To strengthen European industrial leadership

- To support R&I initiatives in line with the Europe

- 2020 objectives and industry needs

- To translate research into innovation

- To increase industry commitment to joint objectives

EU PPP programok típusai

- *'contractual' PPPs:* annual ring fenced budget for participation in normal calls, based on an industry developed Strategic Research Agenda (FoF, EGWI, etc.)

- *Joint Technology Initiatives:* like the 'contractual PPPs' but ring fenced budget over 7 years and strong commitments of industry outside calls (ARTEMIS, ENIAC, Clean Sky, etc.)

EC-5G PPP Association megállapodás

On December 17, 2013 the EU Commission signed the PPP Contractual Arrangement with the representatives of the **5G-infrastructure PPP Association**, which describes the mutual commitment of both parties to the partnership in terms of the high-level ambitions, Key Performance Indicators and the intended budget envelope of the PPP for the financial period 2014 to 2020.

Mobil generációk
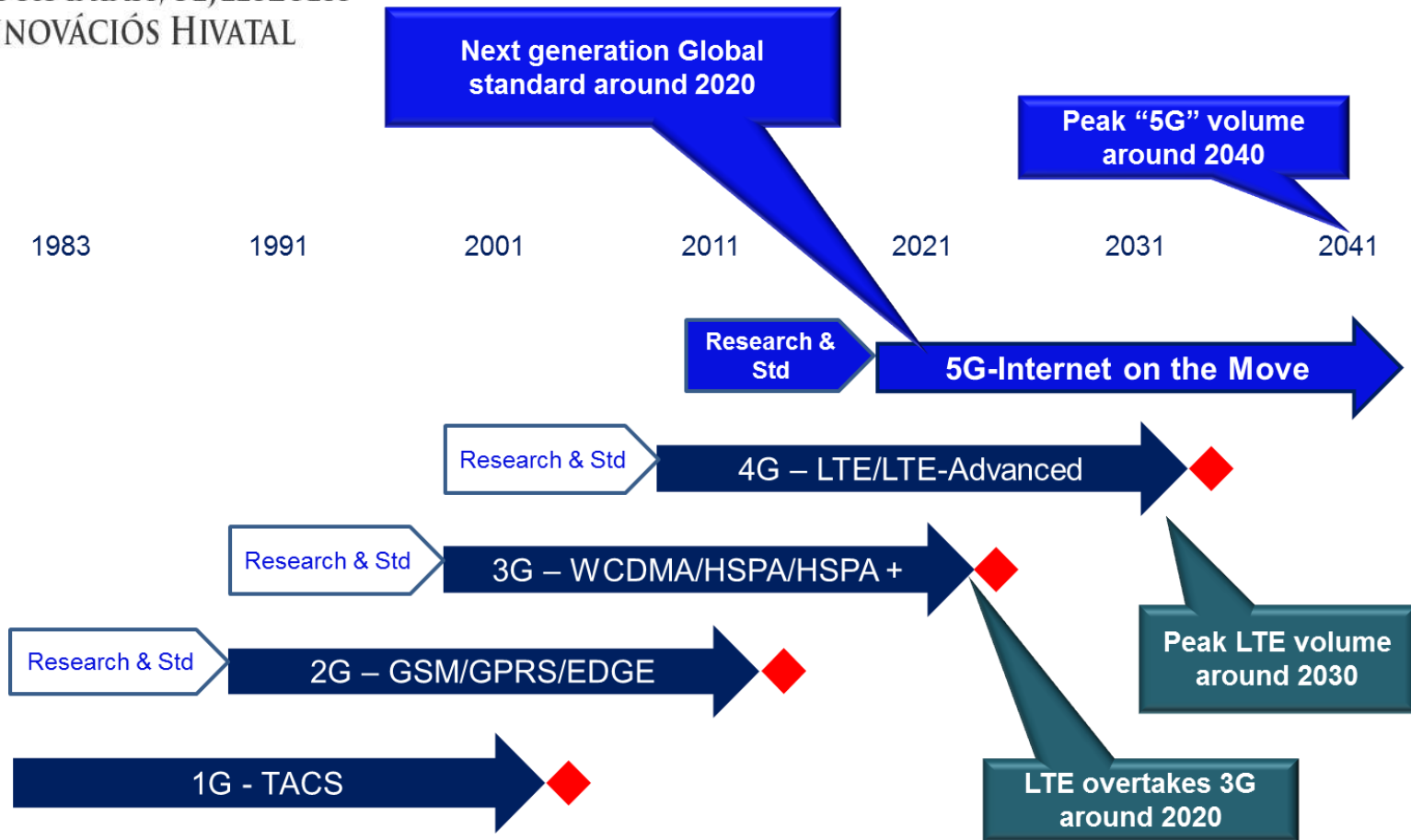
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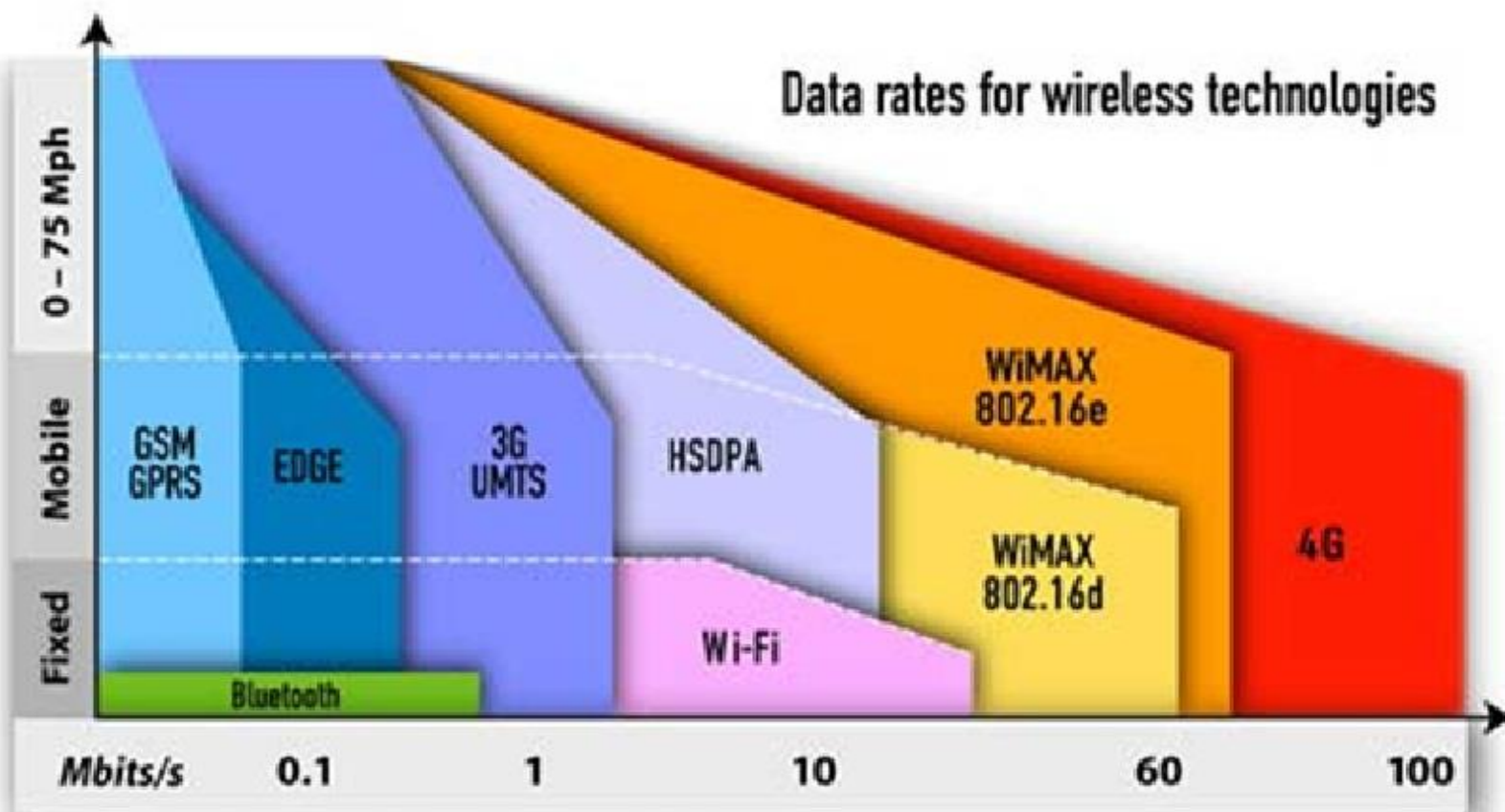
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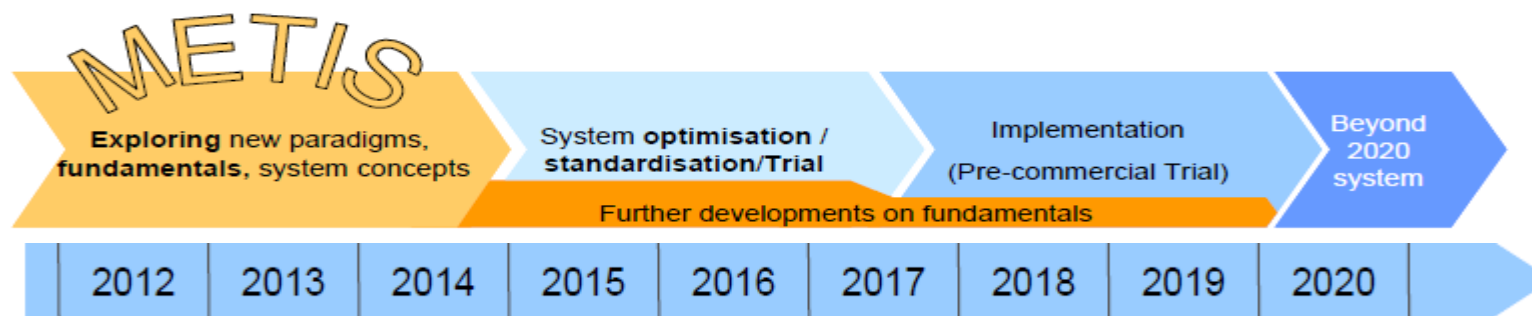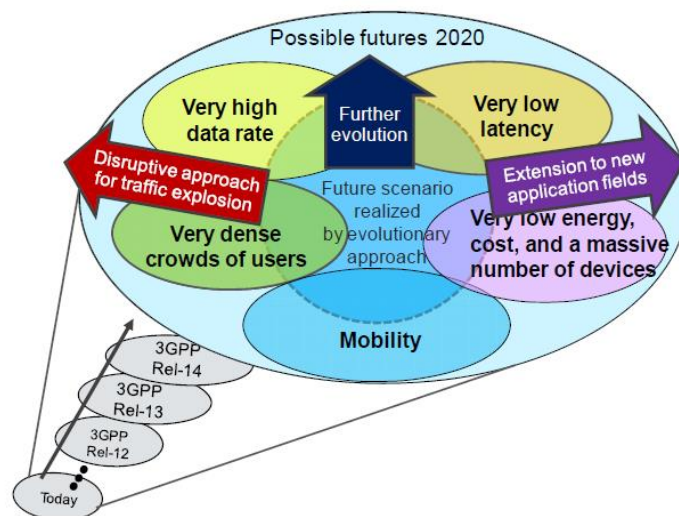
H2020 Call - Advanced 5G network infrastructure for the Future Internet

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Challenge: A jelenleginél 1000-szer nagyobb mobil adatforgalom 2020-ra. Heterogén, alacsony fogyasztású vezeték nélküli, „ubiquitous" nagy sebességű és kapacitású mobil hálózati infrastruktúra.

Scope: Rádiós hálózati architektúrák és technológiák, protokollok, a Frekvencia spektrum hatékonyabb kihasználása. Hálózati virtualizáció és szoftver hálózatok,innovatív 5G transceiver megoldások, stb.

Expected impact: 10-100-szor magasabb adatsebsség, ötször kisebb „end-to-end" késleltetés (4G-LTE, 5 ms), 10-szer alacsonyabb energiafogyasztás, 5G-s szabványok, stb.

Type of action: Research & Innovation Actions (100 % funding), Innovation Actions (70 % funding), CSA

Funding: 125 millió Euro (700 millió Euro) + ipari hozzájárulás (kb. 3.5 milliárd Euro)

Deadline: 25 November, 2014

Motivations for a FI 5G PPP Initiative

- High economic importance

- Addressing growing markets

- Solving perceived limitations of network infrastructures

- 5G programmes now starting globally

- Reinforcing the 7 million European jobs in the sector and the > 3 % GDP contribution

Call for action, Commissioner N. Kroes, MWC 2013

5G is more than NG Mobile Network

- **Ubiquitous, faster, better, stronger**
  - 10 Gbit/s, 1 ms latency
  - More secure, lowe energy consuption, lower operating costs
- **M2M, Internet of Things**
  - 100B connected objects
- **New services and applications**
  - SDN, integration with cloud
  - Innovations yet to be invented

5G will affect the whole infrastructure even though Radio Access is the key!

5G Programme – Contractual PPP

- Open Call, but:
  - Achieve more than a group of standalone or loosely coordinated projects
  - Avoiding gaps, „hype" issues
  - Optimising overall project portfolio but leaving space for flexibility
  - Ensuring an optimum set of projects, working together
  - Broad agreement on project scopes, their interfaces and possible cross-issues between projects

5G PPP Pgrogramme – Three Phases

- Ignition Phase (2012-2013)
  - Projects METIS, 5GNOW, iJOIN, TROPIC, COMBO,…
- Phase I – Research work (2014-2015)
- Phase II – System optimisation (2016-2017)
- Phase III – Large-scale trials (2017-2018)

5G PPP – High Level KPIs

- 1000 times higher wireless area capacity and more service capabilities

- Saving up to 90 % of energy per service

- „Zero perceived" downtime for service provision

- Very dense deplyments of wireless communication

- Enabling advanced user privacy

5G PPP – Pre-structuring Model

- More than a group of standalone projects, pulling **strands** together
- Pre-structuring model
  - Ensuring that the right set of projects will work together
  - Model focused on projects not proposals as such
  - Possible set of projects scopes, their interfaces and the possible cross-issues between projects
- Possibility to have proposals submitted according to the model
- Possibility to have EC reviewers making their best selection to fill one project with the best corresponding proposal
- Avoiding duplication and gaps issues

5G PPP Strands (1)

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5G PPP Call - 3 RTD Strands, 1 INNO Strand, CSA projects

Strand 1: Radio network architecture & technologies

- *Increased frequency re-use, versatile low-cost radio access infrastructure (IoT to > 1Gbps) + low energy*

- *Architecture for 5G "tranceivers" and micro-servers*

- *Key hardware building blocks to support various spectrum usage scenarios*

- *Preparing for large scale demonstrators and test-beds (possibly leveraging existing experimental facilities)*

<u>Strand 2</u>: Convergence beyond last mile

•*Ubiquitous access continuum*

•*Cooperative, cognitive fixed and heterogeneous resources, with fixed optical access reaching at least 10 Gb/s*

•*Address access sharing issues related to competition and business models*

<u>Strand 3</u>: Network management

•*Novel approaches (e.g. SON, QoS-enabled)*

•*Combination SDN/autonomic management*

•*Security across virtualised SDN domains*

<u>*Type of Action*</u>*:*
Research and Innovation – Large projects

5G PPP Strands (4)

Strand 4: Network virtualisation and Software Networks

•*Virtualisation*

•*Orchestration*

Type of Action:
Innovation – Large projects

5G PPP CSA

Support to initiative (Target budget: € 2 million)

Targeted themes:

- Support to programme integration
- Societal challenges
- Monitoring PPP process
- Analysis international activities
- Standardisation support and spectrum policy support
- 5G web site
- Roadmaps key PPP technologies and for experimental requirements/facilities

Type of action:

Support actions – Small projects

Köszönöm a figyelmet!

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